

TECHNICAL SPECIFICATIONS
FOR
IMPROVEMENTS TO BASHAN LAKE DAM
EAST HADDAM, CONNECTICUT
DEEP Project Number WR-DR-4113-2014-03
DEEP Dam Number 4113

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NOTICE TO CONTRACTOR- HANDLING WATER LIQUIDATED DAMAGES

The Contractor is made aware that as part of the “Handling Water” technical specification, there is a liquidated damage clause.

NOTICE TO CONTRACTOR- PROTECTING EXISTING DAM COMPONENTS TO REMAIN IN PLACE

The Contractor shall protect from damage all existing dam components which are to remain in place after construction is completed and shall stage and undertake his work to minimize damages to such components. Such components include embankment walls, a majority of the right embankment, the low level outlet conduit, spillway, fence posts, etc. The Contractor shall avoid operating heavy machinery over such components to minimize damages (eg, no concrete mixers driven on top of the right embankment crest or directly over the spillway). Any damages caused by the Contractor's operations shall be repaired at the Contractor's expense, as directed by the Engineer.

NOTICE TO CONTRACTOR- SPECIES OF SPECIAL CONCERN

The Contractor is notified that suitable habitat for the Eastern box turtle (*Terrapene carolina*), which is a Species of Special Concern, surrounds the work sites. During construction the following precautionary measures shall be implemented:

1. Workers should be apprised of the possible presence of turtles, and provided a description of the species. See photo below as well as the following DEEP website:

http://www.ct.gov/deep/cwp/view.asp?a=2723&q=416520&deepNav_GID=1655

2. Sediment control systems should be installed around the work area prior to activity.
3. After sediment control systems are installed and prior to work being conducted each day, a sweep of the work area should be conducted to look for turtles.
4. Any turtles that are discovered during construction should be moved, unharmed, to an area immediately outside of the sediment control systems, and positioned in the same direction that it was walking.
5. Work conducted during early morning and evening hours should occur with special care not to harm basking or foraging turtles.
6. All sediment control systems should be removed after work is completed and soils are stable so that reptile and amphibian movement between uplands and wetlands is not restricted.



ITEM #7- HANDLING WATER

Description: Work under this item shall consist of the following:

1. Design and construction of required measures to lower the lake level prior to the start of construction and maintaining the water level during construction, as indicated on the plans or as directed by the Engineer.
2. Construction of such temporary flow diversions, barriers or other such protective facilities and methods as are necessary for re-directing, conducting (through and beyond the construction area) or controlling water as may be necessary to perform all proposed project work. For the purposes of this specification, this item shall be understood to mean any temporary type of approved (by the Engineer) protective or diversion device or facility which the Contractor elects to build or use to satisfy, and which does satisfy, the condition that the permanent structures and other work be placed and built in the dry. If a temporary cofferdam is required for any project work and it is not specifically included elsewhere, it shall be assumed to be included in this item for handling water. The handling of flood flows, the protection of existing structures and any or all of the finished construction during high water, as well as the protection of the lake environment and wildlife habitat, shall be included in the scope of the work under this item.
3. Any pumping necessary to perform all proposed project work in the dry.

Materials: Not applicable.

Construction Methods: Handling water shall be in accordance with the water handling narrative provided in the plans, or as may be approved by the Engineer. It is noted that the draw down of the lake shall not commence prior to Labor Day and all outflow past the dam must be terminated by the following February 1. It is also noted that wooden stop logs shall be installed to the top of the existing concrete cofferdam (used during the previous 1983 repairs) as soon as the lake level falls to the invert of such concrete cofferdam so that the lake may begin to refill. Refer to the attached figures for information pertaining to this existing cofferdam.

The Contractor shall investigate and verify the existing lake and soil conditions, and evaluate the need for, and the type of protection and facilities required for the work and maintaining these work areas in the dry, providing these protection facilities meet the minimum requirements shown on the contract plans and required by the contract specifications. All facilities shall be in accordance with the DEEP Dam Construction Permit, the U.S. Army Corps of Engineers Section 404 Permit and any other applicable permits. Before commencing construction, the Contractor shall furnish the Engineer with a separate detailed plan for handling water, including working drawings, computations and details of the plan and methods he proposes to use for temporary cofferdams for handling water and methods he proposes to use for lowering the lake level, as well as accomplishing the work. The furnishing of such plans and methods shall not relieve the Contractor of any of his responsibility for the safety of the work, effectiveness of the temporary protective structures and the temporary de-watering facilities, or for the successful completion of the project. In addition, the Contractor may be required to submit and present his plan(s) to the DEEP or the U.S. Army Corps of Engineers, and make any revisions as may be required to comply with or modify the associated permits.

The height of any cofferdams, flow diversions and barriers shall be as elected by the Contractor to provide reasonable protection from flooding. All such temporary structures or facilities shall be safely designed, extended to sufficient depth and be of such dimensions and water-tightness so as to re-direct water around the work area, assure protection of the structure excavation area and construction of the permanent work in the dry without interfering with proper performance of the work, increase flooding beyond existing conditions or create additional safety hazards. Their construction and location shall be such as to permit excavation for the permanent work to the limits shown on the plans. Interior dimensions shall give sufficient clearance for construction and inspection of forms. Movements or failures of the temporary protection facilities, or any portions thereof, which prevents proper completion of the permanent work shall be corrected and/or relocated at the sole expense of the Contractor.

Relocation of water around and beyond the work area shall be done in accordance with the approved staging, handling water and E&S control plans, and only upon approval of the Engineer and shall be done in such a manner that meets all permit requirements, minimizes the number of relocations required and minimizes downstream sedimentation and impacts to the wetland environment. Piping or pumping shall not be permitted unless otherwise specifically approved by the Engineer in advance. Open channels (or piping if approved) for conducting water beyond the work area, including headwalls or side walls, shall be of a type as recommended by the Contractor as necessary to provide reasonable protection from flooding.

Any pumping from within the areas of construction shall be done in such a manner as to prevent the possibility of movement of water through any fresh concrete. No pumping will be permitted during placing of concrete or for a period of 24 hours thereafter, unless it will be done from a suitable sump properly located and with sufficient pumping capacity to protect against damage from sudden rising of water. Any pumped water must be discharged to a pumping settling basin or other approved sediment removal device prior to discharging to any wetland area. All discharging of pumped water must be performed in accordance with the requirements of Section 1.10.

Unless otherwise provided, or directed, all such temporary protective work shall be removed and disposed of in an approved manner when no longer required.

The Contractor shall be responsible for the scheduling of work under this item so as not to interfere with any sequence of operation developed for this project. Delays as a result of work required under this item shall not constitute a claim for an extension of contract time.

Any scheme for water handling and or lowering of the lake level presented in the contract documents represents the minimum requirements that must be met; however the Contractor must submit his own plan for handling water and lowering of the lake level, along with supporting documentation and computations. If the Contractor proposes a water handling or lowering of the lake level method substantially different from the scheme presented in the contract drawings, or if the actual scheme used requires substantially more or different wetland impacts, the Contractor will be required to make any necessary modifications to the permits.

Method of Measurement: This item shall be paid on a lump sum basis, and as such, will not be separately measured for payment.

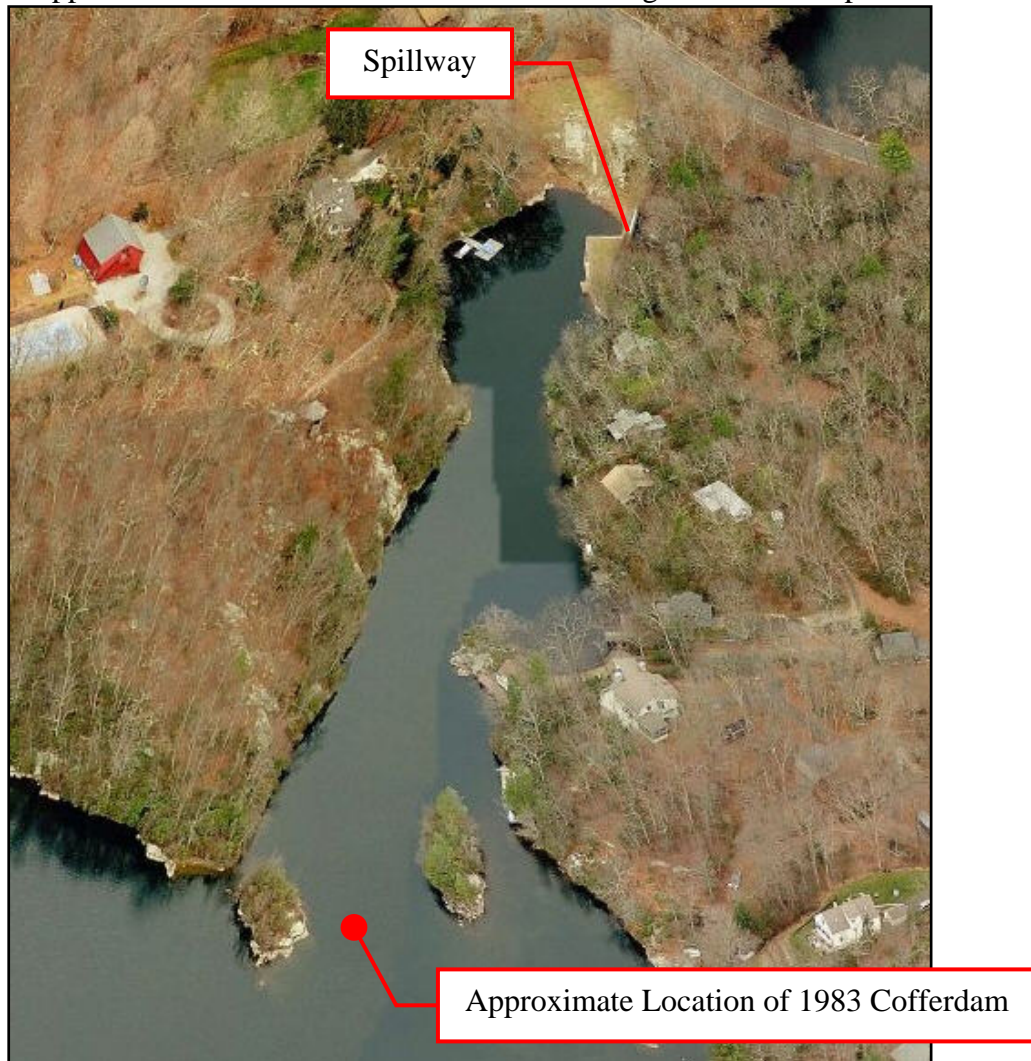
Basis of Payment: Payment for this item will be included in the contract lump sum price for “Handling Water”, complete and accepted, which price shall include all tools, material, equipment, labor and work incidental to lowering the lake level and maintaining water levels, and construction; reconstruction; if required; including handling of flow during construction. This work shall include construction, reconstruction, relocation or repair (if required) of all flow diversions (including piping or open channels), barriers or other such protective facilities necessary for the protection of the work from flow, as well as conduction of water out of the work area and beyond the limits of construction, including all planning, calculations, engineering, drawings and meetings incidental thereto. Payment shall also include the removal and disposal of all protective works or facilities; and damages resulting from the handling of water, including those incurred by the Contractor; damage to existing facilities or to the work in progress, damage to the lake environment and wildlife habitat, and damage to public or private property.

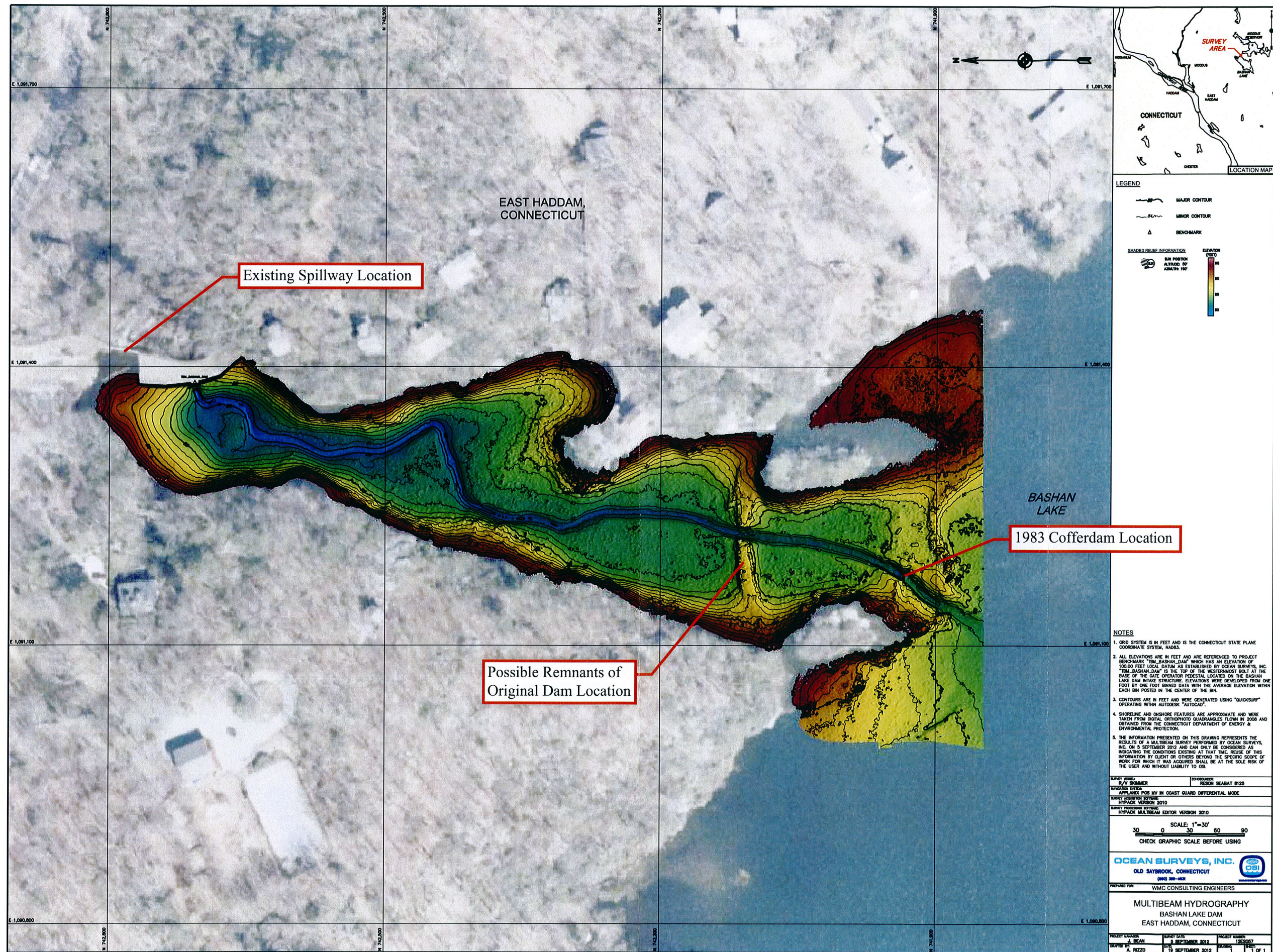
Payment shall include the de-watering of the various work areas during construction operations as necessary for the disposal of water pumped or otherwise removed from the various construction areas and release of this water into wetland areas (including pumping and any related environmental controls used in dewatering or handling water operations, as well as, handling of the reservoir pond flow). This item shall also include the construction or installation and maintenance of temporary pumping settling basins or devices to be used for discharge of pumped water, as well as adequate discharge areas for these basins or devices.

Additionally, this item includes operation of the existing/proposed sluice gate as well as all labor, tools, equipment, and materials associated with the installation of the wooden stop logs in the existing concrete cofferdam used during the previous 1983 dam repairs.

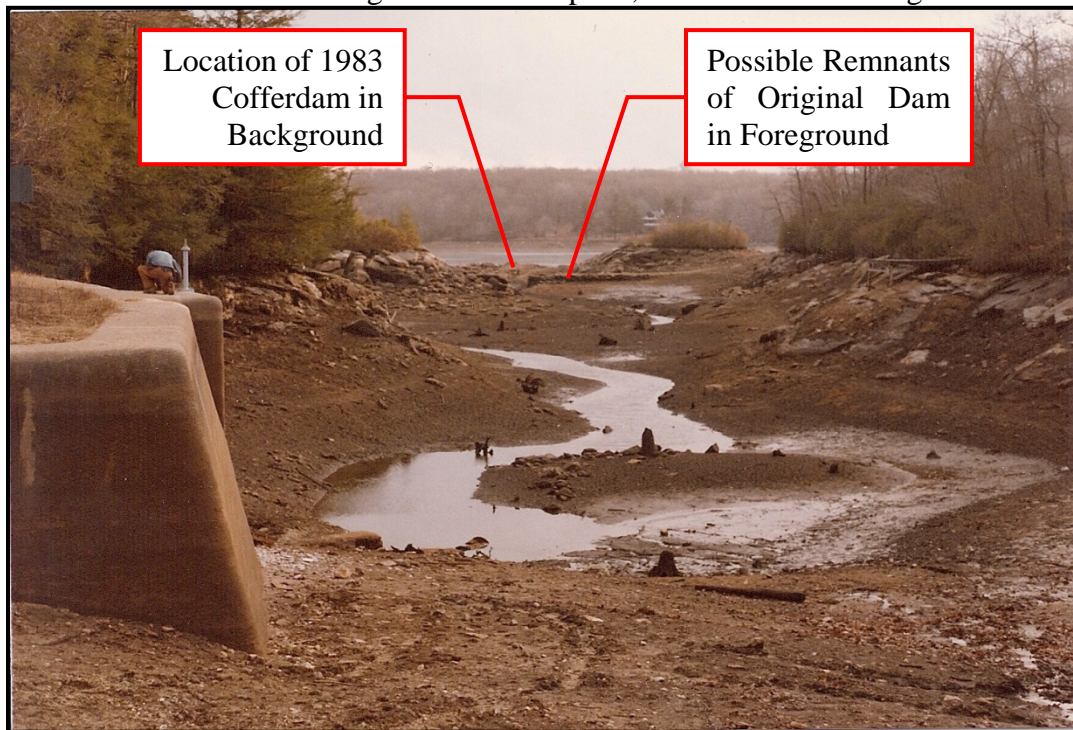
For each day past the February 1 following the initiation of the lake draw down that the Contractor allows outflow to discharge past the dam, the Contractor shall be assessed liquidated damages at the rate specified in the Supplemental Conditions, unless otherwise approved by the Engineer.

Approximate Location of Cofferddam used during 1983 Dam Repairs

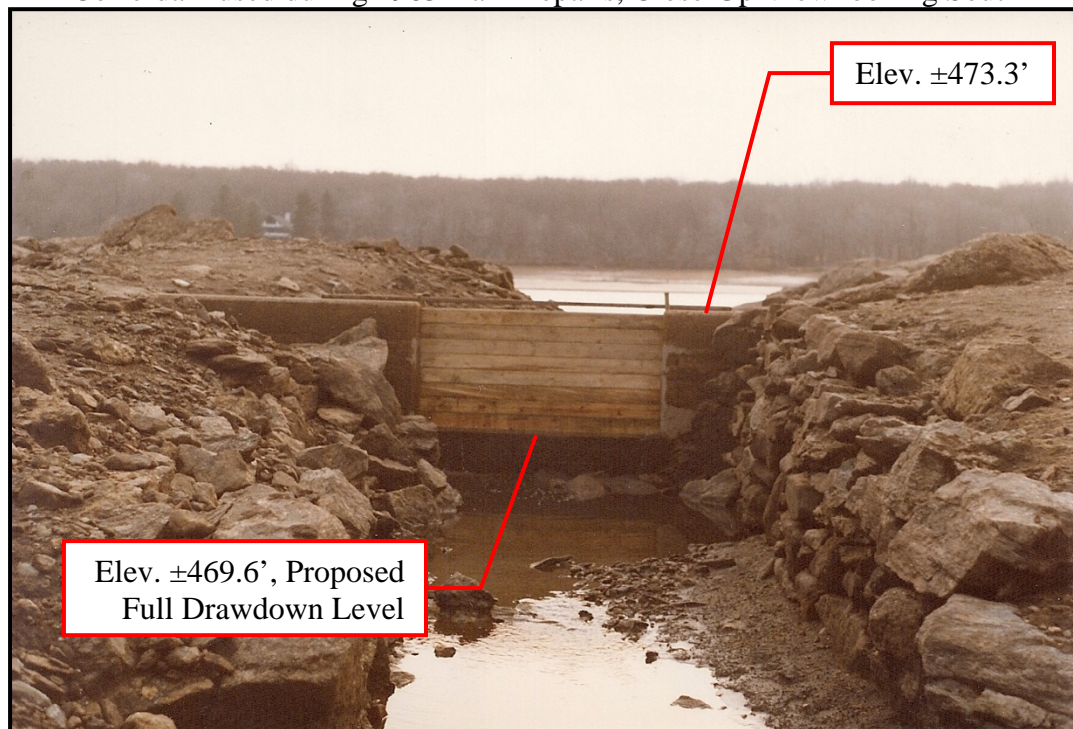




Cofferdam used during 1983 Dam Repairs, Distant View looking South



Cofferdam used during 1983 Dam Repairs, Close-Up View looking South



ITEM #8- ANTI-TRACKING PAD

Description: Work under this item shall consist of the installation, maintenance, and removal of anti-tracking pad(s), in accordance with the contract plan details at the plan locations or as ordered by the Engineer. Where anti-tracking pads are to be installed adjacent to paved surfaces with curbing, the work shall include the removal of the curbing and the replacement of the curbing when the pad is removed.

Materials: The crushed stone for this work shall conform to the requirements of Article M.01.01 for No. 3 coarse aggregate. Geotextile shall conform to the requirements of Article M.08.01-26. Materials incidental to and necessary for the installation of the geotextile, such as, but not limited to sewing thread, staples, pins, etc., shall conform to the requirements of the manufacturer of the geotextile.

Materials for the curbing, shall conform to the requirements of Division III, Materials, Section, of the Standard Specifications, for the appropriate curbing type.

Construction Methods: The area(s) on which the anti-tracking pad(s) are to be placed shall be shaped to a reasonably true surface prior to the installation of the geotextile. The geotextile shall be installed at the location(s) and to the dimensions as shown on the plans or as directed by the Engineer. Geotextile shall be installed as recommended by the manufacturer for the specific use. Crushed stone shall be placed over the geotextile to the depth shown on the plans and shall be finished to a smooth uniform surface matching into the surrounding grade.

The Contractor shall add crushed stone and regrade the pad during the construction phase as required to maintain the depth of stone as noted on the plans. Upon completion of work at a site, the anti-tracking pad(s) shall be removed in its entirety and the site restored to its original condition.

Excavated material from the installation of the anti-tracking pad(s) shall be stockpiled by the Contractor and shall be used for the restoration of the site when the pad is removed with the following exception. .

At locations where the anti-tracking pad is adjacent to a paved surface with curbing, the Contractor shall remove the curbing from the pavement in a manner to minimize any damage to the pavement. The anti-tracking pad shall be installed to match the pavement grade.

Upon removal of the pad(s), the Contractor shall construct replacement curbing matching the material, dimensions and details of the existing curbing at the site. Construction of the curbing shall be in general accordance with the Standard Specifications for the appropriate curbing material type (concrete, stone, or bituminous).

Method of Measurement: This work shall be measured by the actual number of square yards of completed and accepted anti-tracking pad(s).

Basis of Payment: This work will be paid for at the contract unit price per square yard for

“Anti-Tracking Pad” which price shall include all excavation, backfill, stockpiling of material, removal of curbing, disposal of surplus material, crushed stone, geotextile, backfill, tack coat, curbing and all equipment, tools, labor and materials incidental to the installation, maintaining and removal of the anti-tracking pad(s) and adjacent curbing.

ITEM #9- WATER POLLUTION CONTROL

Work under this item shall conform to the requirements of Section 2.10 of the State of Connecticut Department of Transportation Standard Specifications for Roads, Bridges and Incidental Construction Form 816 supplemented and amended as follows:

Description: Add the following:

General: The construction effort for this project requires work to be performed on the fringe, directly in and/or directly over, the lake. As such, precautions must be taken by the Contractor to insure that the lake environment is not unnecessarily disturbed or is not contaminated with sediment, chemicals or other pollutants as a result of the Contractor's operations or work. In addition to complying with the contract documents (plans & specifications), it is expected that the Contractor will take all necessary precautions to protect the lake environment from his work operations, and that all work shall comply completely in all aspects to Section 1.10 of the Standard Specifications, and the requirements and attachments of local, State & Federal permits, as well as the requirements set forth in the Connecticut Department of Transportation document "Best Management Practices", which is a part of the Connecticut Department of Transportation publication "On-Site Mitigation for Construction Activities". Special provisions and additional pay items may have been included in the contract documents to address some of these issues and the Contractor is advised to review any special provisions.

The Contractor will be expected to comply with the requirements of all permit and contract documents, including the stage construction and E&S control measures outlined therein. However, to insure understanding and compliance, the Contractor will be expected to submit a written water pollution control plan, including individual plans or sections for construction operations & staging, E&S control, dewatering, disposal of excess material, stockpiling, etc.

In addition, the Contractor is reminded that review and approval authority is granted to the State of Connecticut Department of Energy and Environmental Protection (DEEP) for all construction operations and related water pollution control procedures.

Materials: Add the following:

Water pollution prevention, including prevention and control of soil erosion and sedimentation is of primary importance. The minimum procedures required for construction operations, erosion and sediment (E&S) control and handling water shall be followed by the Contractor as outlined in the plans and specifications, including sections 1.10 and 2.10 of the standard specifications Form 816. Minimum requirements for the environmental portions of the water pollution control plan are presented as follows.

EROSION & SEDIMENT CONTROL PLAN

The erosion & sedimentation (E&S) plan will essentially follow the Contractor's proposed sequence of construction and as shown on the erosion and sedimentation control details sheet. The Contractor will be expected to install erosion & sedimentation measures in accordance with the approved E&S plan and maintain sediment and erosion controls such that they are effective at all times. To ensure understanding, confirm procedures and construction sequencing, and confirm compliance, prior to construction the Contractor will be required to prepare and submit (in writing) a Plan of Operations and an Erosion & Sediment (E&S) Control Plan to the Engineer and the DEEP for review and approval. If the E&S plan does not substantially follow and comply with the contract drawings, the Contractor shall be required to revise his plan or obtain a modification from the DEEP. No construction activities shall commence until the Plan is approved by the Engineer and the DEEP. The Contractor will be required to comply with the approved Plan at all times. Any material or equipment placed or discharged to a wetland or watercourse, not in accordance with the contract documents or approved E&S plan, will be considered a wetlands violation and such material or equipment shall be removed immediately; the Contractor will then be required to restore the impacted wetland or watercourse as specified by DEEP.

Sedimentation and Erosion Controls will be installed by the Contractor prior to the various stages of construction according to the approved plan, and these E&S controls will be modified and maintained as needed and directed by the Engineer as construction proceeds to ensure protection of the wetland resources. Standard sedimentation and erosion control practices will be as outlined in the "Connecticut Guidelines for Soil Erosion and Sediment Control" (2002), as amended, and included in the construction contract documents. This will include temporary measures, which are shown on Erosion and Sediment Control Details, such as silt fence and hay bales. The E&S Plan will consist of the approved construction plans and the following outline:

Sediment Control – Prior to initiating any work in an area, silt fence or haybales must be installed to encompass the limits of all work areas, as well as at the toe of all fill or cut slopes, in order to intercept sediment flow from work areas or from disturbed excavation or fill areas toward stream or wetland environments. Silt fence or haybales shall remain in place until turf is sufficiently established to provide effective stabilization of disturbed area.

Turbidity Control Curtains – Prior to initiating any work over or in the lake area, turbidity curtains shall be installed in lengths and locations as may be directed by the Engineer or DEEP, in order to intercept floating debris or sediment from downstream areas. Turbidity control curtains shall remain in place until all work in or above the lake is complete.

Turf Establishment – Turf Establishment shall be performed on all disturbed areas immediately upon completion of each stage or sub-stage, or as otherwise directed by the Engineer. All Turf Establishment shall be repaired, supplemented and/or maintained by the Contractor throughout the construction process and until the growth of long lived grasses is sufficiently established to provide effective stabilization of disturbed area.

Catch Basins – Where catch basins are not installed in conjunction with a bituminous pavement course, or are installed in any location or sequence such that sediment is flowing into the catch basins, then effective temporary measures shall be taken at these catch basins to prevent silt laden water from entering these basins. These measures shall include, but not be limited to such measures as surrounding catch basins with silt fence or hay bales, inserting

geotextile fabric under the frame, redirecting water to a silt fence, hay bale or stone check dams before it reaches the catch basins. All measures must be approved by the Engineer prior to installation and may be modified by the Engineer if measures are deemed to be inadequate or inappropriate.

Maintenance of E&S Measures – In his E&S plan, the Contractor shall designate an employee as the responsible person for installation, inspection and maintenance of E&S measures, and this person shall work directly with the DEEP designated site inspector and DEEP agent. All E&S control measures shall be maintained in accordance with contract documents and this E&S plan. As a minimum, measures shall be inspected and maintained by the Contractor on a daily basis, as well as after storm events of ½ inch or more. On Friday afternoons, all measures shall be inspected and repaired as needed to ensure that they are in good working order for the upcoming weekend. First thing on Monday mornings, all measure shall be inspected to ensure that they are in good working order after the weekend.

DEWATERING PLAN

The Contractor shall be required to control all water pumped in order to control water levels and dewater during trench and structural excavation operations. Turbid water generated by the Contractor through dewatering operations or other activities shall be effectively treated prior to discharge to a wetland or watercourse in order to avoid sedimentation of these systems. The Contractor shall discharge *all* pump water to a riprap pump discharge pad, pumping settling basin, “silt bag”, or a combination thereof, surrounded by silt fence or hay bales. In no case, however, shall such pump discharge pads be located within a wetland or watercourse, but they shall be set back from the stream as far as possible, and yet be reasonably convenient to the construction operations. To slow the discharge and increase cleansing, where ever possible, discharge pads shall be located in areas that will discharge through undisturbed underbrush and ground cover. Additional rows of silt fence, stone check dams or hay bale check dams shall be added as needed between discharge pads and the stream area to assist in cleansing discharge flow.

Based upon pump discharge volume and velocity, the dimensions of the pump discharge pads may be increased at the direction of the Engineer or the DEEP in order to mitigate any erosion or sedimentation caused by the pump discharge water. As needed, and as directed by the Engineer or DEEP, all pump discharge pads will also be maintained by the Contractor to insure that dewatering activities do not discharge turbid waters to a wetland or watercourse.

To insure understanding & compliance, the Contractor shall also describe dewatering operations in his submitted E&S plan, including how he/she will perform all dewatering operations for all excavations and stages and how he/she will carry out the requirements of the contract drawings. Such operations shall, at the minimum, be in accordance with approved permits and the contract documents including the attached Staging Details Sheets and the Erosion and Sedimentation Control Detail Sheet.

DISPOSAL OF EXCESS MATERIAL

The Contractor will be required to submit, in writing, an excess material disposal plan to the Engineer and DEEP. This plan shall include the disposal location, written evidence that he has permission from the land owner to dispose of this material, and a written statement from the owner that the disposal of this material on his property does not violate any local zoning or wetland regulations. The disposal of excess material shall be in accordance with all applicable federal, state and municipal laws and requirements and no excess material shall be disposed of until such plan is approved by the Engineer and DEEP.

STOCKPILE OF MATERIAL ON SITE

The Contractor shall be limited to stockpiling materials only in on-site locations that will be within slope and disturbance limits of the proposed work as shown on the contract drawings. All materials stockpiled on-site, must be surrounded by silt fence or other measures to prevent siltation of surrounding land or lake areas, as well as adequately protected from the weather as appropriate, including rain, wind and snow. The Contractor shall repair, supplement or correct these protective measures as directed by the Engineer.

Construction Methods: Add the following:

Detailed Water Pollution Control Plan: In addition to the significant concerns regarding pollution and/or sedimentation of the lake environment in which this project is located, the available construction working space for this project site is limited. Therefore, the sequencing and staging of operations and equipment is critical in order to maintain traffic, maximize the existing available space, and minimize sedimentation and/or pollution due to construction operations and water discharge. Prior to the commencement of any site work, the Contractor shall submit for review and approval, a formal **Water Pollution Control Plan** that includes distinct and separate sections for E&S control, staging of construction operations, dam structures removal, dewatering, disposal of excess material and stockpiling of material. Plans shall generally follow any plans or descriptions presented in the contract documents (plans and specifications), and shall be specific to the construction operation of each stage or phase of the work. Authority and jurisdiction for review and approval of this plan shall be the DEEP.

The Water Pollution Control Plan shall generally include, but not be limited to the following:

- **Construction Sequencing & Phasing Plan** (drawings & written description) that describes procedures and steps for maintaining traffic while sequencing all construction operations during all phases or stages of construction.
- **Erosion & Sedimentation Control Plan** including construction stage specific (utilities, structure and roadway) drawings and descriptions for controlling run-off and sedimentation, including proposed silt fence, check dams, catch basin protection, discharge pads, stockpile areas, etc. E&S plans shall incorporate all erosion and sediment requirements of the contract documents (plans and specifications) and the approved permits (including conditions and supporting information).

- **Dewatering Plan** that includes all procedures for handling discharge of excavation water including site plan showing location of all dewatering control structures, including cofferdams, pump intakes and discharges, portable filter boxes, portable sedimentation systems, silt control barriers, and discharge basins. Details of all dewatering devices including earth berms, cofferdams, pumping settling basins, etc. for dewatering and control of water from excavated areas should be provided, as well as pump and discharge capacity data. Construction phasing or sequencing of all operation should also be considered when preparing the plan; a separate plan should be submitted for each phase as required to reflect changes in control measures during different phases.

The Water Pollution Control Plan shall also include and directly address each of the following:

- **Location for stockpiling** materials, including erosion & sedimentation protection controls for each area.
- **Location of Field Office** – include on E&S or construction phasing mapping.
- **Disposal of Excess Materials** – Means of disposal of concrete, earth, rock and other construction debris. These materials should not be discharged to a watercourse or placed in an area where they may wash into the watercourse. Location, property owner agreement and property owner compliance certification regarding zoning and wetlands regulations for all excavated material disposal sites.
- **Scrap Steel** - Location of an approved disposal site for scrap steel.
- **Emergency Spill Procedures** The Contractor shall maintain a list of subcontractors onsite, emergency phone numbers, onsite hazardous materials, and his refueling procedures. Spills of fuel or any other hazardous materials shall be reported immediately by the Contractor to the Connecticut DEEP Oil and Chemicals Spills Unit. The phone numbers of any contact agencies should be included in the proposed plan & prominently posted at the project site. Response plans for any accidental pollution of the watercourse and/or surrounding soil, and breakdown of water pollution and erosion and sedimentation control measures. Provisions for the quick retrieval of any machinery, equipment, debris or material which accidentally falls into the watercourse.
- **Equipment List** to be utilized including Model, Capacity, Year and Serial Number.
- **Working Drawings & back-up computations** for items such as Handling Water, cofferdams, sheet piling, Removal of Existing Masonry and Sedimentation & Erosion Control.
- **Debris** - Methods for preventing materials such as paint removal, structure removal or other construction debris, dust, and blasting materials from falling into the watercourse. Discharge of these materials to the watercourse or disposal within the watershed is strictly prohibited.
- **On-Site Vehicles** - Methods and locations of refueling, servicing, and storage of vehicles and machinery. Refueling and maintenance shall be done at least 75 feet from the wetland or normal pool level on a geotextile mat and that machinery and vehicles be stored at least 75 feet from the normal pool level when not in use. Securing of adequate

storage and maintenance areas should be done prior to preparation of the plan and bidding.

Servicing and refueling of vehicles and machinery should be done in a manner, which prevents the spillage of oil, gasoline, or other hazardous liquid onto the ground surface or into the watercourse. An impervious containment area is recommended for this purpose.

- **Storage of oil, paint, and other hazardous materials** - These materials should be removed from the site during non-working hours and stored in an indoor locked area.
- **Contact persons** - Name, address, and telephone number(s) of the Contractor contact person for the duration of the project.

Approval of the Water Pollution Control Plan shall not serve to relieve the Contractor of any of his responsibility for the safety of the work or the successful completion of the project.

Method of Measurement: Section 2.10.04 is amended as follows:

- 1) At the end of the second paragraph add the following:

All work approved and performed under this item on a cost-plus basis will be paid under this item and no construction order will be needed to pay for this work.

- 2) Add the following paragraph:

The preparation, submittal and revision of the various plans required under this special provision, as well as attendance and presentation at permitting agencies, shall not be measured separately for payment, but shall be included in the overall work of other contract pay items.

Basis of Payment: Section 2.10.05 is amended as follows:

- 1) Add the following paragraph:

No additional payment shall be made for the preparation and implementation of the various plans addressed by this special provision, but this work shall be included in the related work items or in the general cost of the work, including preparation, submittal and revision of the overall plan for Water Pollution Control procedures, as well as meeting attendance and presentation to permitting agencies.

ITEM #11- IMPERVIOUS FILL

Description: “Impervious Fill” shall consist of furnishing all materials, labor, equipment and testing necessary to complete the work to the dimensions, lines and grades shown on the plans and as directed by the Engineer.

Materials: Impervious Fill material shall meet the following gradation:

<u>Sieve Size</u>	<u>Percent Passing by Mass</u>
No. 10	100
No. 40	75-100
No. 200	40-100

Additionally, the Impervious Fill shall have a permeability of 10^{-5} cm/sec. or less at 95% of its maximum dry density. Impervious Fill shall contain less than 10% organic materials by mass.

The Contractor shall submit the results of laboratory organics testing, grain size gradation tests, optimum tests and permeability tests from samples taken from the proposed material source to verify compliance with the required specifications. The test results shall be submitted to the Engineer at least two weeks prior to use. The Engineer shall determine the quantity and locations of samples for the tests.

Construction Methods:

Impervious Fill shall be placed, compacted and graded to the elevation shown on the plans as directed or as approved by the Engineer. Fill material shall be placed in uniform horizontal lifts of not more than 6” (loose depth) before compaction. Prior to and during compaction operations, the material shall have the optimum moisture content required for the purpose of compaction to least 95% of the modified optimum density in accordance with ASTM D-1557.

Impervious Fill shall be placed in maximum loose lifts of 6” in depth and compacted to at least 95% of modified optimum density (ASTM D-1557) using a vibratory compactor with minimum static weight of 1 ton. No work shall proceed without the Engineer’s approval of the Impervious Fill material and the initial subgrade condition. All areas not passing this compaction requirement shall be excavated and re-compacted to the specification at the Contractor’s expense.

A minimum of two field density tests shall be taken on the initial lift and at each 12” layer thereafter, by an independent materials testing laboratory approved by the State of Connecticut Department of Transportation. The tests shall be conducted by a certified technician with a nuclear gauge using the direct transmission method.

Method of Measurement: This work will be paid for at the contract unit price per cubic yard of Impervious Fill complete and compacted in place, including all materials, equipment, tools and labor incidental thereto.

Basis of Payment: This material will be paid for at the contract unit price per cubic yard for "Impervious Fill", complete in place, which price shall include all materials, equipment, tools, labor and work incidental thereto, as well as the cost of all laboratory and field testing to verify permeability, gradation and compaction requirements of this specification.

ITEM #12- EMBANKMENT FILL

Description: “Embankment Fill” shall consist of furnishing all materials, labor, equipment and testing necessary to complete the work to the dimensions, lines and grades shown on the plans and as directed by the Engineer.

Materials: Embankment Fill material shall meet the following gradation:

<u>Sieve No. or Size</u>	<u>Percent Passing by Mass</u>
3/4"	100
No. 4	35-75
No. 10	30-70
No. 40	5-60
No. 100	0-40
No. 200	0-25

Additionally, the Embankment Fill shall have a permeability of 10^{-5} cm/sec. or less at 95% of its maximum dry density. Embankment Fill shall contain less than 10% organic materials by mass.

The Contractor shall submit the results of laboratory organics testing, grain size gradation tests, optimum tests and permeability tests from samples taken from the proposed material source to verify compliance with the required specifications. The test results shall be submitted to the Engineer at least two weeks prior to use. The Engineer shall determine the quantity and locations of samples for the tests.

Construction Methods:

Embankment Fill shall be placed, compacted and graded to the elevation shown on the plans as directed or as approved by the Engineer. Fill material shall be placed in uniform horizontal lifts of not more than 6" (loose depth) before compaction. Prior to and during compaction operations, the material shall have the optimum moisture content required for the purpose of compaction to at least 95% of the modified optimum density in accordance with ASTM D-1557.

Embankment Fill shall be compacted to at least 95% of modified optimum density (ASTM D-1557) using a vibratory compactor with minimum static weight of 1 ton. No work shall proceed without the Engineer's approval of the Embankment Fill material and the initial subgrade condition. All areas not passing this compaction requirement shall be excavated and re-compacted to the specification at the Contractor's expense.

A minimum of two field density tests shall be taken on the initial lift and at each 12" layer thereafter, by an independent materials testing laboratory approved by the State of Connecticut Department of Transportation. The tests shall be conducted by a certified technician with a nuclear gauge using the direct transmission method.

Method of Measurement: This work will be paid for at the contract unit price per cubic yard of Embankment Fill complete, compacted and accepted in place, including all materials, equipment, tools and labor incidental thereto.

Basis of Payment: This material will be paid for at the contract unit price per cubic yard for "Embankment Fill", complete, compacted and accepted in place, which price shall include all materials, equipment, tools, labor and work incidental thereto, as well as the cost of all laboratory and field testing to verify permeability, gradation and compaction requirements of this specification.

ITEM #20- REMOVAL OF EXISTING WOODEN BRIDGE

Work under this item shall conform to the requirements of Section 5.03 of the State of Connecticut Department of Transportation Standard Specifications for Roads, Bridges and Incidental Construction Form 816, amended as follows:

Description: Replace the first sentence with the following:

This work shall consist of the removal and satisfactory disposal of the existing wooden footbridge across the spillway as shown on the plans.

Materials: Refer to Section 5.03.02

Construction Methods: Replace the entire Article with the following:

All work shall proceed as directed by and to the satisfaction of the Engineer and in accordance with the plans, or as approved by the Engineer.

The Contractor's attention is drawn to the environmental sensitivity of the lake and surrounding wetlands. All debris shall be promptly cleaned up and removed from the site. The removal shall not result in damage to any permanent construction (new or existing) or to adjoining property or lake area. If damage does occur, it shall be repaired by the Contractor to the satisfaction of the Engineer at no additional expense to the State.

Method of Measurement: Refer to Section 5.03.04

Basis of Payment: Replace the first paragraph with the following:

This work shall be paid for at the contract lump sum price for "Removal of Existing Wooden Bridge", which price shall include all materials, equipment, tools, labor, and all work incidental to the removal of the existing wooden bridge. It shall also include the satisfactory removal and disposal of all wasted materials.

ITEM #21- 3" DIA. SCHEDULE 80 BLACK PIPE

Description: Work under this item shall consist of fabricating and installing 3" dia. schedule 80 black pipe guiderail system, consisting of rebar vertical legs tied into closure pour, rebar legs secured into crushed stone, end/toe plate and gusset welded to pipe, as shown on the plans, as directed by the Engineer and in accordance with this specification.

Materials: Materials for this work shall conform to the following requirements:

The pipe shall be 3" diameter IPS schedule 80 round black pipe.

Toe Plate and Gusset shall be fabricated with ½" thick steel. Conforming to ASTM A709, Grade 50F2 (ASTM A709M, Grade 345F2).

Rebar legs shall be ASTM A615 Grade 60, having a minimum yield strength of 60,000 psi deformed bar.

Construction Methods: Before fabricating any materials, the Contractor shall submit Calculations, manufactures specifications and shop drawings to the Engineer for approval. These drawings shall include but not be limited to the following information: The boat launch plans showing the guiderail system, including, pipe, rebar legs, gusset and end/toe plates.

The pipes shall be fabricated straight and installed flush on the crush stone base.

All welding details, procedures and nondestructive testing shall conform to the requirements of AWS D1.1 Structural Welding Code - Steel.

Method of Measurement: This item shall be paid on a lump sum basis, and as such, will not be separately measured for payment.

Basis of Payment: Payment for this item will be included in the contract lump sum price for "3" dia. schedule 80 black pipe", complete and accepted, which price shall include rebar legs, end /toe plate, gusset, all tools, material, equipment, labor and work incidental necessary to install the guiderail system.

ITEM #22- CLASS “A” CONCRETE

Description: Refer to Sections 6.01.01 and 6.02.01 of the State of Connecticut Department of Transportation Standard Specifications for Roads, Bridges and Incidental Construction Form 816. This item shall consist of furnishing and installing “Class “A” Concrete” and “Reinforcing Steel” as called for in the plans or as directed by the Engineer.

Materials: Refer to Sections 6.01.02 and 6.02.02.

Construction Methods: Refer to Sections 6.01.03 and 6.02.03.

Method of Measurement: Refer to Section 6.01.04.

Basis of Payment: Refer to Section 6.01.05. No direct payment shall be made for “Reinforcing Steel”, but the cost thereof shall be considered as included in the cost of “Class “A” Concrete”.

ITEM #23- CLASS “F” CONCRETE

Description: Refer to Sections 6.01.01 and 6.02.01 of the State of Connecticut Department of Transportation Standard Specifications for Roads, Bridges and Incidental Construction Form 816. This item shall consist of furnishing and installing “Class “F” Concrete” and “Reinforcing Steel” as called for in the plans or as directed by the Engineer. This item shall also include installing the necessary formwork to extend the existing low level outlet conduit through the new reinforced concrete downstream buttress wall.

Materials: Refer to Sections 6.01.02 and 6.02.02.

Construction Methods: Refer to Sections 6.01.03 and 6.02.03.

Method of Measurement: Refer to Section 6.01.04.

Basis of Payment: Refer to Section 6.01.05. No direct payment shall be made for “Reinforcing Steel”, but the cost thereof shall be considered as included in the cost of “Class “F” Concrete”.

ITEM #24- DRILLING AND GROUTING REINFORCING BARS

Work under this item shall conform to the following specifications, which replaces the requirements as outlined in Section 6.02 of the State of Connecticut Department of Transportation Standard Specifications for Roads, Bridges and Incidental Construction Form 816.

Description: Work under this item shall consist of drilling or core-drilling holes in concrete, stone masonry or rock and setting reinforcing bars into the holes with adhesive bonding material at the locations shown on the plans, in accordance with the plans, the manufacturer's recommendations, or as directed by the Engineer.

Materials: Reinforcing bars shall conform to Article 6.02. The adhesive bonding material shall be a resin compound specially formulated to anchor steel bars in holes drilled into concrete, stone masonry or rock for the purpose of resisting tension pull-out. The adhesive bonding materials shall be as recommended by the product manufacturer and selected from the Connecticut Department of Transportation Approved Product List. A Materials Certificate and a Certificate of Compliance shall be required for the adhesive material in accordance with Article 1.06.07, certifying the conformance of this material to the requirements stated herein.

Construction Methods: The Contractor shall drill holes into the concrete, stone masonry, or rock to the size, depth and at the locations shown on the plans. If no hole size is specified, the hole shall be at least ¼ inch larger than the specified reinforcing bar, or as recommended by the adhesive manufacturer for the estimated pull-out force, whichever is larger. Drill and bit types used shall be such that they will drill a clean hole; especially for holes into cement stone masonry without causing damage to the existing stone masonry.

The Contractor shall submit the following to the Engineer for approval: type of drill, diameter of bit, method of cleaning holes and method of placement of the adhesive bonding material. Specifications and recommendations for the aforementioned may be obtained from the manufacturer of the adhesive bonding material. The mass of the drill shall not exceed 20 pounds.

The reinforcing dowels shall be able to develop a pull-out resistance of 90 percent of their nominal yield strength when bonded at the embedment depths provided. The Contractor shall provide the minimum cover for the dowels as shown on the plans.

If the existing reinforcing steel is encountered during drilling into existing concrete structures, the holes may be relocated only if approved by the Engineer. Hole locations on stone masonry shall be selected to minimized cracking of the stones or damage to the stone masonry, marked in the field and approved by the Engineer prior to actual drilling. Drilling methods shall not cause spalling, cracking, or other damage to the concrete or stone masonry. Those areas damaged by the Contractor shall be repaired by him in a manner suitable to the Engineer and at no expense to the Owner.

Method of Measurement: If noted on the plans as included in the cost of other work, drilling and grouting of reinforcing bars shall not be measured for payment. If not included in the cost of other work, this work will be measured for payment by the actual number of linear feet of dowel reinforcing bars grouted into drilled holes, completed and accepted.

Basis of Payment: If noted on the plans as included in the cost of other work, drilling and grouting of reinforcing bars shall not be paid for separately. If not included in the cost of other work, this work will be paid for at the contract unit price per linear foot for “Drilling and Grouting Reinforcing Bars”, which price shall include drilling and preparing holes, and applying adhesive bonding material in the hole. It shall also include all reinforcing bars, materials, equipment, tools and labor incidental thereto.

ITEM #25- ACCESS DOOR

Description: Work under this item shall include the manufacture and installation of the access door on top of the new low level inlet gate chamber structure. This will include the frame, hardware and attachments as shown on the plans or as directed by the Engineer.

Material: The access door shall be a 42" by 42" Model J-5 Bilco Door, including frame and hardware (or approved equal). The materials shall conform to the following specifications:

- Finish Color- Black
- Steel casting for access doors and other items - ASTM A36.
- Stainless steel casting for hardware - ASTM A276, Type 316.

Construction Methods: The access doors, frame and hardware shall be installed according to approved shop drawings based on actual field measurements of the installed gate chamber structure and manufacturer's recommendations and installation guidelines. The Contractor shall allow in his bid for at least one site visitation by the door manufacturer's representative to confirm door and frame size.

Method of Measurement: Work on this item, being paid for on a lump sum basis, will not be measured for payment.

Basis of Payment: This work shall be paid for at the contract lump sum price for "Access Door" manufactured, installed, and accepted in place including frames, hardware attachments and other appurtenant equipment and materials to make it a complete installation. The price shall also include all hardware, attachments, materials, equipment, tools and labor incidental thereto.

ITEM #26- PREFABRICATED BRIDGE

Description: Work under this item shall consist of the design, furnishing, fabrication, delivery, assembly, and installation of a prefabricated steel truss bridge in accordance with the plans, specifications and other contract documents. The prefabricated truss bridge shall be of the configuration and generally meet the length and dimensions as indicated on and in accordance with the plans, the manufacturer's recommendations or as otherwise directed and approved by the Engineer.

Qualified Prefabricated Steel Truss Supplier: The Bridge Manufacturer shall be currently certified by the American Institute of Steel Construction to produce fabricated structural steel for Major Steel Bridges as set forth in the AISC Certification Program.

Pre-approved Bridge Manufacturers:

1. CONTECH Engineered Solutions, West Chester, OH
2. Manufacturer of an approved equal product: Any product submitted by the Contractor for consideration as an approved equal must be accompanied by design computations and structural details, and shall be subject to review and approval by the Engineer and the DEEP. To insure the proposed substitution will comply with these specifications, the following documentation must be included:
 - Proof of AISC Major Bridge certification and Welders Qualifications
 - Proof that manufacturer regularly engaged in the business of manufacturing prefabricated steel bridges for at least five (5) years
 - Representative design calculations
 - Representative drawings
 - Splicing and erection procedures
 - Welding process
 - Warranty Information
 - Inspection and Maintenance procedures
 - References and list of projects of similar construction completed and in service for at least three (3) years

The Engineer will evaluate and verify the accuracy of the submittal. If the Engineer determines that the qualifying criteria have not been met, the Contractor's proposed bridge manufacturer shall be rejected. The Engineer's ruling shall be final. The bridge supplier shall be the designer and fabricator of the bridge and shall not assign, sublet, or subcontract any part of the bridge fabrication.

Materials: The bridge shall be as follows:

Inside Clear Width- 5 feet

Overall Bridge Length- ± 50 feet (to be confirmed by the Contractor prior to fabrication)

Type- Underhung floorbeams, Continental Connector (or approved equal)

Superstructure Depth- 12 inches max., from top of deck to bottom of underhung floorbeams

Finish- All bridge components shall be hot-dipped galvanized

Deck- Galvanized grating

Railing- Pedestrian complaint as well as OSHA compliant for industrial use

Design Specifications - AASHTO LRFD Bridge Design Specifications (6th Edition)

Uniform Live Load- 90 psf

Vehicular Live Load- 5000 lbs

The materials for the prefabricated steel truss shall conform to the following requirements:

1. Steel- All structural truss members shall be constructed from steel having minimum yield strength (Fy) of 50,000 psi. All steel for railings shall be constructed from steel having minimum yield strength (Fy) of 36,000 psi. All structural steel, structural shapes and connections shall meet the minimum requirements for structural steel from Section 6.03 of ConnDOT Form 816. Truss members (top and bottom chords, vertical and diagonal members) shall be constructed of square or rectangular tubular sections.
2. Hardware- The prefabricated steel truss bridge, including all connections and assembly locations, shall be performed and installed as designed and supplied by the manufacturer. Any and all hardware required to assemble and erect the superstructure, as well as secure it to the substructure elements, shall be provided by the manufacturer. This shall include anchor devices, bearing/expansion devices and pads, as well as all incidental hardware. All nuts, bolts, washers, steel rods and other miscellaneous hardware shall meet the minimum requirements from Section 6.03 of the ConnDOT Form 816, as well as Article M.06 as referenced therein. High strength nuts, bolts and washers shall be in accordance with ASTM A325 Type 1 or ASTM A490. All nuts, bolts, washers and steel rods associated with the bearing supports shall be hot-dip galvanized in accordance with ASTM A153 or ASTM A123 as applicable.

Construction Methods: The construction methods for this work shall conform to the following general requirements:

Design-

1. Bridge Design Codes: The following standards and/or specifications are referenced, as applicable:
 - a. AASHTO LRFD Bridge Design Specifications (6th Edition)
 - b. CONNDOT Bridge Design Manual (2003)
 - c. CONNDOT Standard Specifications for Roads, Bridges & Incidental Construction, Form 816
 - d. American Institute of Steel Construction (AISC), as applicable for steel design including manual of Hollow Structural Sections Connections
 - e. American Society for Testing & Materials (ASTM), as applicable for steel manufacturing, welds, painting, fabrication, galvanizing, etc.
 - f. American Welding Society (AWS) Structural Welding Code, D1.1
 - g. American Galvanizers Association (AGA)
2. Prefabricated Steel Truss Design:

- a. Design Loads- In addition to structure dead load, the prefabricated steel truss shall be designed to accommodate live loads. Bridge superstructure, including trusses, floorbeams, and deck, shall be designed for a 5000 lb. vehicular loading and pedestrian loading in accordance with AASHTO LRFD specifications. Railings shall be designed in accordance with AASHTO LRFD specifications for pedestrian loads and applicable vehicular loads.
- b. Allowable Deflections- Vertical deflection due to pedestrian loading and vehicular loading shall be evaluated independently and both shall not exceed $L/800$. The horizontal deflection due to lateral wind load shall not exceed $1/500$ of the span length.

Prefabricated Steel Truss Work-

1. Fabrication: All fabrication shall be performed in an AISC Major Bridge certified plant by qualified Welders.
2. Finishing: After fabrication and prior to shipping for galvanizing, all sharp edges shall be ground or properly smoothed to be suitable for galvanizing and all welding slag or other foreign material or contaminants shall be removed by grit-blasting or other mechanical means. All finishing shall be shop applied and shall be performed in accordance with standard practices of the American Galvanizers Association, including "Selected Specifications for Hot-Dip Galvanizing".

Galvanizing- Structural steel, railings, and other miscellaneous shapes shall be galvanized after fabrication in accordance with ASTM A123 for structural steel (AASHTO M111), providing a minimum coating thickness as defined by Table 1 (Coating Thickness Grade By Material) and Table 3 (Coating Thickness Grade) of ASTM A123 for the material category and thickness. Hardware shall be galvanized in accordance with ASTM A153 for galvanized hardware (AASHTO M232).

The dry kettle process shall be utilized for the application of hot-dip galvanizing. The use of the "wet kettle" process shall be prohibited.

Rugosity: Factory-applied metal coatings shall exhibit a rugosity (smoothness) not greater than 4 rug (16-20 microns of variation) when measured by a profilometer over a 1 inch straight line on the surface. Profilometer shall be capable of operating in 1 micron increments.

Cooling after galvanizing shall be by air drying; liquid quenching is prohibited.

All galvanizing shall be in a controlled environment, maintained and operated so as to meet all environmental and worker safety standards, including OSHA, EPA and local fire regulations, that are applicable to the processes employed.

Permanent and complete records, including ISO required records, must be kept of the galvanizing process conditions, as well as testing of coatings. Records shall be maintained in proper order and be held ready for inspection during the coating process, and held for inspection for up to three years from the completion date of the project.

If any galvanized parts are damaged during shipping or field installation, they must be repaired in accordance with the appropriate ASTM and AGA specifications.

3. Railings: Railings shall be pedestrian compliant as well as OSHA compliant for industrial use. All railings shall be constructed of round or square tubular steel sections, and have a smooth surface with no protrusions or depressions and meet the requirements per the AASHTO LRFD Bridge Design Specifications 6th Edition. All ends of tubes shall be closed and ground smooth with drain holes. The railings shall be shop assembled and shall have a hot-dipped galvanized finish applied after fabrication. Unless otherwise approved, railings shall be attached in the shop prior to shipping and installation; railings shall not be attached to the steel truss in the field.
4. Submittals: The following shall be submitted to the Engineer for approval prior to commencement of any fabrication:
 - a. Final design plans, design computations (including load rating computations and summary) and material specifications for the proposed bridge, all of which shall be signed and sealed by a professional structural engineer licensed in the State of Connecticut.
 - b. Complete shop drawings including bill of materials and hardware schedule containing dimensional descriptions and quantities, all of which shall be signed and sealed by a professional structural engineer licensed in the State of Connecticut.

All design and shop drawing submittals shall be signed and sealed by a Professional Engineer registered in the State of Connecticut. Approval or acceptance of plans and other submittals shall not serve to relieve the contractor of any of his responsibility or liability regarding the successful completion of this construction item.

5. Plan and Calculation Certification: All plans shall be certified to meet minimum AASHTO LRFD specifications and State of Connecticut Department of Transportation requirements for all applicable loads for pedestrian bridges including the 5000 lb. vehicular live load as well.
6. Shipping: The contractor shall coordinate with the manufacturer, such that all materials are shipped directly to the site, and ready for installation in a timely manner in accordance with the construction schedule and operations. Permits and freight charges shall be included in the cost of the bridge and shall not be paid separately.
7. Substructure Preparation and Steel Truss Installation: Prior to delivery of the prefabricated steel truss bridge, abutments shall be prepared and readied for installation of the bridge, including installation of anchor bolts, bearing devices, bearing pads, utilizing materials provided by the manufacturer and performed to the manufacturer's requirements and directions. Prefabricated bridges shall be delivered to the site where the installation is to be performed and assembled (as necessary) so as to be ready for lifting and installation at the designated location and alignment. A representative of the prefabricated bridge manufacturer shall be present at the site, providing guidance and direction during assembly and installation of the bridge to insure that it is installed according to the design specifications and manufacturer's recommendations. The bridge shall be lifted and carefully set into place using equipment and procedures in accordance with the approved shop drawings and

methods of construction, as well as the manufacturer's pre-approved lifting locations on the structure itself. Any damage to final finishes shall be repaired in accordance with coating applicators written recommendations to the satisfaction of the Engineer.

Once the bridge is set in place and properly seated on the bearing devices or pads, it shall be secured into place according to the manufacturer's recommendations and previously approved shop drawings and procedures.

8. Warranties: In addition to any warranties or guarantees required by ConnDOT Form 816, the Contractor shall also provide the follow warranties:
 - a. A manufacturer's warranty of at least 10 years against defects in materials, production and workmanship for the prefabricated bridge.
 - b. A warranty from the coating applicator of at least 35 years against rusting.

Method of Measurement: Being paid for on a lump sum basis, this work will not be measured for payment.

Basis of Payment: This work will be paid for at the contract lump sum price for "Prefabricated Bridge", at the location as indicated, complete and accepted in place, which price shall include design, preparation and revision of design submittals and shop drawings, fabrication and shipping of the prefabricated bridge, galvanizing, incidental hardware and connections, provision and installation of bearings and bearing devices, provision and installation of anchor bolts and anchoring devices, cranes and other equipment for unloading and installation, delivery, freight and permit charges, and all materials, hardware, equipment, tools, labor, and work incidental thereto. This item shall also include all costs associated with any alternate prefabricated steel truss item substitution.

ITEM #27- MISCELLANEOUS STAINLESS STEEL

Description: Work under this item includes furnishing and installing the new gate chamber trash rack, the vertical channels holding the trash rack in place, the vertical channels holding the timber weir boards in place, horizontal rack support channel, lockable grating, and all miscellaneous attachments, plates, hardware and miscellaneous materials.

Materials: All stainless steel shall be AISI type 316. Prior to fabrication, the Contractor shall submit to the Engineer for approval fabrication drawings of all stainless steel members, including details for locking the grating in place.

Construction Methods: The trash racks and support assemblies shall be installed according to the contract drawings and as recommended by the fabricator and approved by the Engineer. The Contractor's attention is drawn to the fact that close dimensional tolerances are required for both concrete and steel work in this area and that coordination between the concrete installer, the fabricator and the Engineer is important to avoid improper fit conditions. Prior to fabrication, final dimensions and details shall be adjusted to match actual field conditions and dimensions and shop drawings shall be submitted to the Engineer for approval.

Method of Measurement: Work on this item, being paid for on a lump sum basis, will not be measured for payment.

Basis of Payment: This work shall be paid for at the contract lump sum price for "Miscellaneous Stainless Steel", which includes the furnishing of shop drawings, as well as all labor, materials and equipment, and performing all the operations in connection with the provision and installation of the trash rack and accessory equipment, all channels and lockable grating. The price shall include all associated attachments, hardware, supports materials, equipment, tools and labor incidental thereto.

ITEM #28- REPAIR MASONRY

Description: Work under this item shall consist of repairing all existing stone masonry structures to remain including the existing downstream face of the spillway, the left downstream masonry embankment wall and the right downstream masonry embankment wall. This item includes re-chinking, removing loose or deteriorated Shotcrete along the downstream side of the dam, removing and resetting loose or damaged stone masonry and filling voids with new stones/mortar/concrete as required and directed by the Engineer in the field. Work under this item shall also consist of re-setting and reconstructing stone masonry around and just below the new concrete spillway crest to provide a neat line at the stone masonry/concrete interface.

Materials: All replacement and chink stones shall be of similar size, type and coloration as the existing stone masonry, generally meeting the requirements of Article M.11.02 of Form 816. The mortar shall conform to the requirements of Article M.11.04 of Form 816. Concrete used to fill large voids behind the stone masonry shall be Class “F” Concrete and shall conform to the requirements of Article M.03.01 of Form 816. For exposed mortar and concrete, color additives or the color of sand used in the mix shall be such that the color is similar to the existing mortar hue and color. Cured samples of the mortar color shall be submitted to the Engineer for approval prior to starting the work.

Construction Methods: Approximate areas of repair are shown on the plans. However, prior to initiating work, all existing stone masonry structures to the dam shall be reviewed with the Engineer, and all areas requiring repair shall be noted and marked with material that will not be permanent or mar the appearance of the stone masonry in any way. Unless otherwise called for in the plans or as may be directed by the Engineer, stone masonry along the downstream side of the dam and spillway shall be re-chinked rather than repointed to allow for the free passage of any embankment seepage.

Work shall conform to the requirements of Section 6.06 “Cement Rubble Masonry”, Section 6.07 “Dry Rubble Masonry” and Section 6.09 “Repointed Masonry” of Form 816, as applicable. All areas of repair shall be repaired to the entire depth or thickness of the hole or damaged area. Concrete may be used for interior portions of deep repairs, but the surface façade must be stone/block matching existing wall surface stones in shape, size, type and texture, unless otherwise called for in the plans or as may be directed by the Engineer.

Unless otherwise approved for repointing, all joints, regardless of the condition or soundness of the existing mortar, shall be raked out to the minimum depth as indicated in the Standard Specifications.

Method of Measurement: The quantity of repaired masonry shall be the actual number of square yards completed and accepted with the neat lines as shown on the plans or as ordered.

Basis of Payment: This work will be paid for at the contract unit price per square yard for “Repair Masonry”, which price shall include all new stone, mortar, and concrete, scaffolding, labor, materials, equipment and tools incidental thereto.

ITEM #29- SLUICE GATE

Description: Work under this item includes the installation of a new sluice gate, hoisting mechanism, stem with guides, flush-mounted locking floor-box, anchoring devices, a cast wall thimble for the sluice gate frame attachment, any connections to the existing outlet conduit, a T-handle wrench, gas powered portable operator, and appurtenant work.

Materials: Prior to fabricating any materials, the Contractor shall submit shop drawings and installation requirements for the sluice gate, hoisting mechanism, thimbles for frame attachment, anchoring systems, operating floor-box, and key for gate stem operations. In addition, upon completion of the installation, the Contractor shall submit to DEEP a maintenance manual for the gate system.

The sluice gate shall be 30"W by 24"H Rodney Hunt Type HY-Q with flushbottom closure (or approved equal), with F-type wall thimbles and flange frame. The gate, stem, stem guides, and floor stand shall meet all design requirements of AWWA C501, latest revision. The gate shall be designed for seating pressures. Stem guides shall be located as recommended by the gate manufacturer, the stem shall be stainless steel and minimum stem size shall be 2-1/2".

Materials shall conform to the following specifications:

Iron castings for gate, wall thimble, frame, guides, stem guides, floor-box and other items - ASTM A126, Class B.

Bronze castings for wedges and other items - ASTM B584, Alloy 865.

Bronze for seat facing in frame and gate - ASTM B21, ALLOY B.

Stainless steel for stem and fasteners - ASTM A276, Type 316.

A T-handle wrench and lockable cover for the floor-box for access to the stem nut shall be provided.

In addition, the gas powered portable operator shall be Rodney Hunt Model 25 P.O. (or approved equal).

Construction Methods: The sluice gate and appurtenant hoisting equipment shall be installed to manufacturer's recommendations, installation guidelines and in conformance with the details and intent of the contract drawings. The Contractor shall allow in his bid for two site visitations and fees by the gate manufacturer's representative for final adjustment of the gate and explanation of the maintenance manual and procedures to DEEP personnel.

Method of Measurement: Work on this item, being paid for on a lump sum basis, will not be measured for payment.

Basis of Payment: This work shall be paid for at the contract lump sum price for “Sluice Gate,” which includes the provision and installation of the gate as a total unit, including wall thimble, anchor bolts, hoisting mechanism and other appurtenant equipment and materials to make it a complete installation. It shall also include the inspection of the gate after installation by a service representative. The price shall include all materials, equipment, attachments, hardware, tools and labor incidental thereto.

ITEM #33- PREFABRICATED DRAIN

Description: Work under this item shall consist of furnishing and installing Prefabricated Drain as shown on the plans or as approved by the Engineer, including all necessary materials, labor, tools, and equipment incidental thereto.

Materials: The Prefabricated Drain shall be Eljen EL00500, or approved equal. Any substitution shall be submitted to the Engineer for approval at least 21 calendar days prior to the intended installation.

Schedule 40 PVC piping and fittings conforming to the requirements of Subarticle M.08.01-27. Piping and fittings shall be protected from UV and other damage during storage.

45 mil polypropylene sheeting. The sheeting shall be protected from UV and other damage during storage. Any holes, rips, tears, etc. shall not be accepted for use.

Non-banded stainless steel rat guards by Agri Drain Corporation, or approved equal. Any substitution shall be submitted to the Engineer for approval at least 21 calendar days prior to the intended installation.

ConnDOT No. 6 Crushed Stone conforming to the requirements of Subarticle M.01.01.

Construction Methods: Prefabricated Drain shall be installed to the dimensions shown on the plans or as approved by the Engineer. Other than the end caps, all PVC piping and fittings shall be glued in accordance with manufacturer's recommendations. Prefabricated Drain shall be installed to allow for the positive drainage of any embankment seepage and prevent the buildup of pore pressure within the dam embankment.

The Contractor shall perform his work so as to prevent wet concrete or other detritus materials from entering or clogging the drain. The ends of the Prefabricated Drain, PVC pipes and fittings shall be enclosed and protected so as to prevent wet concrete from clogging the drain during the pour of the surrounding concrete buttress. The surrounding concrete buttress shall be poured in lifts to prevent damage to the Prefabricated Drain. The Contractor shall provide in writing, for approval by the Engineer, the methods he is to use to protect the Prefabricated Drain from damage during the pour of the concrete buttress.

Method of Measurement: This work will be measured for payment by the number of linear feet of Prefabricated Drain completed and accepted in place. PVC piping, PVC fittings, polypropylene sheeting, rat guards, and crushed stone will not be measured separately and shall be included in the unit cost for Prefabricated Drain.

Basis of Payment: This work will be paid for at the contract unit price per linear foot for "Prefabricated Drain", which price shall include all PVC piping, PVC fittings, polypropylene sheeting, rat guards, crushed stone, labor, materials, equipment, and tools incidental thereto.

ITEM #34- GEOTEXTILE EROSION CONTROL CLASS A

Description: This item shall consist of furnishing and installing “Geotextile Erosion Control Class A” to the dimensions shown on the plans as directed or as approved by the Engineer.

Materials: Refer to Section 7.55.02. The geotextile shall be nonwoven and approved for use by the Connecticut Department of Transportation’s latest Qualified Product List. For geotextile in contact with “Impervious Fill”, the Apparent Opening Size (AOS) shall be in the range of the #70-100 U.S. Standard Sieve size and have a permeability greater than that of the “Impervious Fill”.

Construction Method: Refer to Section 7.55.03. The geotextile shall be installed in accordance with manufacturer’s recommendations. The geotextile shall not be installed over any underlying surface that shall cause damage to the fabric during construction.

Method of Measurement: Refer to Section 7.55.04.

Basis of Payment: This work will be paid for at the contract unit price per square yard of “Geotextile Erosion Control Class A,” complete in place, which price shall include all materials, labor, tools, and equipment incidental and necessary for each type of installation and removal where necessary.

ITEM #35- 56" PRECAST CONCRETE JERSEY BARRIER**8.21.01 - Description:** *Add the following:*

This item shall include the fabrication, furnishing and installation of Cleaths, Dock Guard Bumpers and Composite Boards as shown on the plans and within this specification, or as ordered by the Engineer.

8.21.02 - Materials: *Add the following:*

Boat Cleat to be hot dipped galvanized (ASTM A123).

Dock Guard Bumpers or approved equal.

Composite boards trex or approved equal.

8.22.03 - Construction Methods: *Add the following:*

Before fabricating any materials, the Contractor shall submit Calculations, manufactures specifications and shop drawings to the Engineer for approval. These drawings shall include but not be limited to the following information: Two rows of inserts at the bottom of the barrier curb for attaching the precast concrete jersey barrier curb to the proposed bulkhead footing and stem. Inserts shall be spaced according to the plan 9" on center with 3" of cover to the nearest face.

Dock Guard Bumpers shall be anchored to the composite board and then to the precast concrete jersey barrier curb. See boat launch plans for spacing, sizes, type and location of Dock Guard Bumpers, Composite Boards an anchor bolts. The contractor shall install the bulkhead system as shown on the plans or as directed by the engineer.

8.22.04 - Method of Measurement: *Replace with the following:*

This item shall be paid on a lump sum basis, and as such, will not be separately measured for payment.

8.22.05 - Basis of Payment: *Replace with the following:*

Payment for this item will be included in the contract lump sum price for "56" Precast Concrete Jersey Barrier Curb", complete and accepted, which price shall include fabrication, furnishing and installation of boat cleaths, dock guard bumpers, composite boards, all tools, material, equipment, labor and work incidental necessary to install the 56" precast concrete barrier curb bulkhead.

ITEM #36- TEMPORARY PRECAST CONCRETE BARRIER CURB

Work under this item shall conform to the requirements of Section 8.22 of the State of Connecticut Department of Transportation Standard Specifications for Roads, Bridges and Incidental Construction Form 816 amended as follows:

Description: Section 8.22.01 is amended to add the following:

This item shall be amended to include the provision, installation, and maintenance in good working order throughout the construction period, of one high-intensity flashing barricade warning light spaced every 10 feet on top of the concrete barrier curb. This item is also amended to include the relocation, adjustment and removal of precast concrete barrier curbs throughout the duration of construction.

Materials: Section 8.22.02 is amended to add the following:

High intensity barricade warning lights shall be in accordance with Section 09.76.02 of the Standard Specifications.

Construction Methods: Refer to Section 8.22.03.

Method of Measurement: Section 8.22.04 is amended and added to as follows:

Delineators shall not be measured separately for payment, but shall be included in "Temporary Precast Concrete Barrier Curb".

Barricade warning lights shall not be measured separately for payment, but shall be included in "Temporary Precast Concrete Barrier Curb".

Relocation, adjustment or removal of temporary precast concrete barrier curbs throughout the duration of construction shall not be measured separately, but shall be included in "Temporary Precast Concrete Barrier Curb".

Basis of Payment: Section 8.22.05 is amended and added to as follows:

Delineators shall not be paid separately, but shall be included in the cost of "Temporary Precast Concrete Barrier Curb".

Barricade warning lights shall not be paid separately, but shall be included in the cost of "Temporary Precast Concrete Barrier Curb".

Relocation, adjustment or removal of temporary precast concrete barrier curbs throughout the duration of construction shall not be paid separately, but shall be included in the cost of "Temporary Precast Concrete Barrier Curb".

ITEM #37- STEEL BOLLARDS

Description: This item shall consist of furnishing and installing steel bollards in front of the bulkhead and concrete pad, including steel shapes, hardware, reinforcement bars and concrete, fully painted, fabricated in accordance with the dimensioned details given, filled with concrete and erected where shown on the plans in accordance with these specifications.

Materials: The materials for this work shall be free from surface blemishes and defects where exposed to view in the finished installation. Materials not specified shall be approved by the Engineer.

Steel Bollard

Finishes shall be factory applied black powder coat with white reflecting strips over standard rust inhibitive primer per manufacturer specifications or approved equal by the Engineer.

Steel for plates shall be type A36 conforming to ASTM A36/A36M-05 specifications.

Steel for tubes shall be type A53 conforming to ASTM A53/A53M-04a.

Fasteners shall be Series 300 Stainless Steel or approved equivalent.

The base should be set in minimum 3000 psi concrete with Grade-60 reinforcing steel, as detailed on the contract plans.

If a discrepancy arises in the materials specified between the contract plans and manufacturer's instructions, the Engineer shall be notified and contacted to make the final decision.

Construction Methods: Install all items as shown on the plans and approved shop drawings. Bollards shall be level and plumb, true to specified lines and grades.

If a discrepancy arises in the construction method specified between the contract plans and manufacturer's instructions, the Engineer shall be notified and contacted to make the final decision.

The Contractor shall be responsible for scheduling the delivery of all items so as to minimize on-site storage time prior to installation. All stored materials and items shall be protected from weather, careless handling and vandalism.

Shop Drawings: Before fabricating any materials, the Contractor shall submit shop drawings to the Engineer for approval, in accordance with Article 1.05.02(b). These drawings shall include, but not be limited to, the following information: the layout plan showing installation of the base unit, reinforcing steel and concrete, all details, material lists and material designations.

Methods of Measurement: This work shall be measured for payment by the number of steel bollards installed and completed.

Basis of Payment: This work shall be paid for at the contract unit price per “Steel Bollard” completed and accepted in place, which price shall include all material, tools, equipment and labor incidental thereto; also all work required in the setting of bollard, materials and reinforced concrete needed to install the base.

ITEM #38- REMOVE CHAIN LINK FENCE

Description: Work under this item shall consist of the removal and disposal of existing chain link fencing and gates at locations indicated on the plans or as ordered by the Engineer and in conformity with these specifications.

Materials: Not applicable

Construction Methods: Existing chain link fencing and gates shall be removed as indicated on the plans or as ordered by the Engineer. This includes the removal of all chain link fencing and posts south of the northerly dam abutment. Posts to be removed which are installed into earth shall be completely removed, including any concrete embedment. Posts to be removed which are installed into existing masonry or bedrock shall be cut flush with such surface with the annular hole filled with mortar.

North of the northerly dam abutment, all fence fabric and gates shall be removed with the existing fence posts retained for reuse under the item “6’ Chain Link Fence (with Existing Posts)”.

The disposal of all removed fencing and gates shall be in accordance with all Federal, State and Town requirements as approved by the Engineer.

Methods of Measurement: This work shall be measured for payment by the number of linear feet complete and accepted of “Remove Chain Link Fence”, measured from outside to outside of end posts.

Basis of Payment: This work shall be paid for at the contract unit price per linear foot for “Remove Chain Link Fence”, complete and accepted in place, which price shall include all material, tools, equipment, and labor incidental thereto.

ITEM #39- 6' CHAIN LINK FENCE

Work under this item shall conform to the following specifications, which replaces the requirements as outlined in Section 9.13 of the State of Connecticut Department of Transportation Standard Specifications for Roads, Bridges and Incidental Construction Form 816.

Description: Work under this item shall consist of furnishing and installing 6 foot high polyvinyl chain link fence with top and bottom horizontal rails supported by metal posts side mounted into the top concrete extension to the downstream right embankment wall at locations indicated on the plans or as ordered by the Engineer and in conformity with these specifications.

Materials: The fence fabric shall be "Fused Bonded Fabric" PVC coated steel meeting the requirements of ASTM F668 Class 2B. Overall height shall be 6 feet. Core wire shall be No. 9 gage steel wire, hot dipped galvanized, with a coating thickness of 0.007 inches. Fabric shall be woven in a 2-inch mesh. Both selvages shall be knuckled. The color of the fence fabric shall be black.

All tension bars; bands and ties shall be vinyl-coated in accordance to U.S. Specification RR-F-191/3C. The color of these items shall be black.

All posts and other appurtenances used in the construction of this fence shall be PVC coated schedule 40 steel pipe in accordance with RR-F-191/3C, Grade A. The color of the posts and other appurtenances shall be black.

Weights and dimensions of fence posts and rails shall be as per the following schedule:

Description	Nominal Outside Diameter	Weight (lbs/ft)
End and Corner, Posts	2-1/2"	3.65
Intermediate Posts	2"	2.72
Top and Bottom Fence Rails	1-5/8"	2.27

Vinyl-clad chain link fabric, posts, framework, and accessories shall be as manufactured by Boundary Fence and Railing Systems, Inc., Richmond Hill, New York or approved equal. The color of all these items shall be Black.

Construction Methods: Posts mounted to retaining wall structures shall be evenly spaced in the line of fence no further apart than 8 feet on center. The posts shall be set in side mounted fence post anchors. Fence post anchors shall consist of steel sleeves, of adequate size for setting PVC coated posts, welded to plates or angles as shown on the Contract Drawings. Fence post anchors shall be hot dipped galvanized after fabrication and attached to concrete structures using Hilti Stainless Steel Kwik-Bolts II, or approved equal. Contractor shall submit details for approval. Posts shall be furnished with pressed steel or malleable iron tops secured by screws.

The top rail shall be provided with couplings approximately every 20 feet. Couplings are to be outside sleeve type at least 6 inches long. The top rail is to pass through the line posts tops and form a continuous brace from end to end of each stretch of fence. The top and bottom rails shall be securely fastened to the terminal posts by heavy pressed steel brace bands and malleable rail end connections.

The chain link fabric shall be securely fastened to all terminal posts using 1/4" x 3/4" tension bars and heavy No. 16 gage steel tension bands. There shall be one band for each foot in the height of fence. The fabric shall be fastened to all intermediate posts and top and bottom rails with No. 9 gage coated (O.D.) tie wires, spacing not to exceed 10 inches.

The fabric shall be stretched to proper tension between terminal posts and securely fastened to the framework members. The bottom of the fabric shall be held as uniformly as is practicable to the finished grade.

Caps shall be securely attached (screwed) on top of all posts.

Installation shall be made in a workmanlike manner by skilled mechanics experienced in erection of this type of fence. The fence shall be erected on line and to grade with all posts plumb.

The Contractor shall field measure to verify all dimensions prior to fabrication

Shop Drawings: Before fabricating any materials, the Contractor shall submit shop drawings to the Engineer for approval, in accordance with Article 1.05.02(b). These drawings shall include, but not be limited to, the following information: the layout plan showing all fence post spacing, all fence post anchors, expansion joint locations, dimensions, curve radii, all details, material lists and material designations.

Methods of Measurement: This work shall be measured for payment by the number of linear feet of completed and accepted "6' Chain Link Fence," measured from outside to outside of end posts.

Basis of Payment: This work shall be paid for at the contract unit price per linear foot for "6' Chain Link Fence," complete in place, which price shall include all material, fence post foundations, fence post anchors, tools, equipment, and labor incidental thereto.

ITEM #40- 6' CHAIN LINK FENCE (WITH EXISTING POSTS)

Description: Work under this item shall consist of furnishing and installing 6 foot high polyvinyl chain link fence with top and bottom horizontal rails supported by existing metal posts at locations indicated on the plans or as ordered by the Engineer and in conformity with these specifications.

Materials: The fence fabric shall be "Fused Bonded Fabric" PVC coated steel meeting the requirements of ASTM F668 Class 2B. Overall height shall be 6 feet. Core wire shall be No. 9 gage steel wire, hot dipped galvanized, with a coating thickness of 0.007 inches. Fabric shall be woven in a 2-inch mesh. Both selvages shall be knuckled. The color of the fence fabric shall be black.

All tension bars; bands and ties shall be vinyl-coated in accordance to U.S. Specification RR-F-191/3C. The color of these items shall be black.

All appurtenances used in the construction of this fence shall be PVC coated schedule 40 steel pipe in accordance with RR-F-191/3C, Grade A. The color of the appurtenances shall be black.

Weights and dimensions of rails shall be as per the following schedule:

Description	Nominal Outside Diameter	Weight (lbs/ft)
Top and Bottom Fence Rails	1-5/8"	2.27

Vinyl-clad chain link fabric, framework and accessories shall be as manufactured by Boundary Fence and Railing Systems, Inc., Richmond Hill, New York or approved equal. The color of all these items shall be Black.

Construction Methods: The top rail shall be provided with couplings approximately every 20 feet. Couplings are to be outside sleeve type at least 6 inches long. The top rail is to pass through the line posts tops and form a continuous brace from end to end of each stretch of fence. The top and bottom rails shall be securely fastened to the terminal posts by heavy pressed steel brace bands and malleable rail end connections.

The chain link fabric shall be securely fastened to all terminal posts using 1/4" x 3/4" tension bars and heavy No. 16 gage steel tension bands. There shall be one band for each foot in the height of fence. The fabric shall be fastened to all intermediate posts and top and bottom rails with No. 9 gage coated (O.D.) tie wires, spacing not to exceed 10 inches.

The fabric shall be stretched to proper tension between terminal posts and securely fastened to the framework members. The bottom of the fabric shall be held as uniformly as is practicable to the finished grade.

Caps shall be securely attached on top of all existing posts.

Installation shall be made in a workmanlike manner by skilled mechanics experienced in erection of this type of fence. The fence shall be erected on line and to grade with all posts plumb.

The Contractor shall field measure to verify all dimensions prior to fabrication

Shop Drawings: Before fabricating any materials, the Contractor shall submit shop drawings to the Engineer for approval, in accordance with Article 1.05.02(b). These drawings shall include, but not be limited to, the following information: the layout plan showing all fence post spacing, expansion joint locations, dimensions, curve radii, all details, material lists and material designations.

Methods of Measurement: This work shall be measured for payment by the number of linear feet of completed and accepted “6’ Chain Link Fence (with Existing Posts),” measured from outside to outside of end posts.

Basis of Payment: This work shall be paid for at the contract unit price per linear foot for “6’ Chain Link Fence (with Existing Posts),” complete in place, which price shall include all material, tools, equipment, and labor incidental thereto.

ITEM #42- PRECAST CONCRETE BOAT LAUNCH PANELS

Description: Work under this item shall consist of designing, furnishing and installing precast concrete boat launch panels constructed of reinforced concrete of the thickness, size and length as dimensioned and detailed on the plans and/or in accordance with these specifications.

This item shall also include the reinforcing, threaded inserts, lifting and seating inserts, fixtures or devices, non-shrink grout, and all other necessary materials and equipment to complete the work.

Materials and Construction Methods: Materials and Construction Methods shall conform to the following requirements:

I. Conditions**A. Submittals**

Within ten (10) calendar days of issue of Notice to Proceed (or Purchase Order) the Contractor shall submit to the Engineer for approval the following documentation and sample:

1. Design of concrete mix.
2. Manufacturer specification documents.
3. Material certifications executed by a responsible officer of the manufacturer, warranting that the product meets or exceeds specified requirements.
4. Material Safety Data Sheets on the materials specified.
5. Written requests to change specifications and/or supply materials other than those specified in the Contract Documents.
6. Samples of specified and substituted materials clearly labeled to show:
 - a. The name and number of the project.
 - b. Manufacturer's name.
 - c. Name, type, quality or grade or any further designation necessary to identify the items or materials.
 - d. Samples submitted shall be of such size, and/or number sufficient to show quality, type, range of color, finish and texture of that which is specified.
7. Name of sub-contractor if applicable.
8. Anticipated schedule for the completion of the Contract.

B. Quality Assurance

1. Materials and work shall conform to ACI 318 and the requirements of the Plans and Specifications. In conflicts among industry standards, required standards, and these Specifications, the more stringent requirements shall govern.
2. The Contractor shall immediately notify the Engineer at the critical stages of the Contract as follows:
 - a. Completion of the first form(s)
 - b. Casting of the first panel
 - c. Verification of concrete compressive-strength for form removal
 - d. Delivery date

3. Sampling of fresh concrete as delivered to the forms on which tests are to be performed to determine compliance with quality requirements of the specifications shall be done in accordance with ASTM C172 Sampling Freshly Mixed Concrete.
4. All concrete testing required in the Specifications shall be performed in accordance with current ASTM Standards.
5. Compressive-strength cylinders shall be tested by a Department of Transportation certified concrete testing facility.
6. All panels shall require an inspection upon delivery to the Department of Energy & Environmental Protection, at which time panels will be confirmed as acceptable or unacceptable.
NOTE: All unacceptable panels shall be the responsibility of the Contractor and shall be replaced by acceptable panels
7. The Contractor shall submit to the Engineer, Certification of Precast Concrete Products Form.

II. Technical Specification

A. Formwork

1. Design Requirements
 - a. The Contractor shall design, engineer and construct formwork, shoring and bracing to conform to code requirements to provide precast panels of the specified dimension.
 - b. Inside form edges shall conform to the dimensions and shapes detailed on the Plans. Edges shall have a radius no greater than 1/4 inch.
 - c. The forms shall be matched, mortar-tight, stiffened, and of sufficient strength to maintain true form and position during placement, consolidation, finishing and curing of concrete, without deflection detrimental to tolerances and finished surfaces.
 - d. Provide chamfer strips as specified on the Plans.
 - e. Forms shall not deviate more than 1/8" from dimensions shown on the plan.
 - f. The Engineer shall be notified at completion of the construction of each form for inspection and approval.
2. Materials
 - a. Form materials shall be at the discretion of the Contractor with the approval of the Engineer.
 - b. Wood or similar form surfaces shall be sealed to correct non-uniform absorption, to prevent emphasis of grain pattern and to prevent discoloration by organic substances.
3. Formwork Accessories
 - a. Wedges, nails, spikes, lag bolts, through-bolts and anchorages sized as required and of sufficient strength and character to maintain formwork in place while placing, consolidating and finishing concrete.
 - b. Form release agent shall be pre-approved by the Engineer, compatible with the form sealer, the concrete itself and shall not stain the concrete surface. The form release agent shall be applied as follows:
 - i. In accordance with manufacturer's recommendations.
 - ii. Prior to placement of reinforcing steel, lifting inserts, and embedded items.

- c. Form sealant (if applicable) shall be pre-approved by the Engineer and be, a one component, moisture curing polyurethane coating, mad applied in accordance with the manufacturer's recommendations.
 - 4. Form Tolerances
Construct formwork to maintain tolerances specified in the Plans and Specifications.
 - 5. Form Cleaning
All surfaces of forms and embedded materials shall be thoroughly cleaned of all accumulated mortar or grout from previous concreting and of all other material before concrete is placed.
 - 6. Form Removal
 - a. Forms shall be stripped when the concrete strength attains a minimum $f'c$ of 2500 psi.
 - b. Stripping time shall be established during the test placement (Section C.5) when test cylinders, field cured along with the concrete they represent, have reached the minimum strength specified, $f'c = 2500$ psi.
 - c. Care must be exercised at all times during the removal of forms to prevent chipping of the comers and damage to the finish surface of the panels. Do not wedge pry bars and/or other stripping tools directly against the concrete.
 - d. Store removed forms in a manner so that surfaces to be in contact with fresh concrete will not be damaged.
 - 7. References
ACI 347 Guide to Formwork for Concrete
 - B. Concrete Reinforcement
 - 1. Section Includes:
Reinforcing bars, lifting inserts, accessories and additional hardware for precast reinforced concrete panel.
 - 2. Submittals
 - a. Submit under provisions of Item I, A.
 - b. Manufacturer's Certificate certifying requirements.
 - c. Manufacturer's specification sheets including instructions and recommendations.
 - d. Material Safety Data Sheets (MSDS).
 - 3. Products
 - a. Reinforcing Steel
 - i. ASTM A615 Grade 60, having a minimum yield strength of 60,000 psi deformed bar.
 - ii. All reinforcement shall be furnished in the full lengths indicated on the Plans.
 - iii. All reinforcing bars shall be epoxy coated after fabrication in accordance with ASTM A775.
 - b. Lifting Inserts
The lifting inserts shall be Dayton Superior F-63 or approved equal. Lifting inserts shall be stainless steel coil lifting inserts. Each insert shall have a safe working load in tension of ≥ 2000 pounds and have a factor of safety 4 to 1.
- NOTE: The lifting insert must be compatible with Dayton/Richmond Double Swivel Lifting Plates and 3¼-inch diameter x 5 ½-inch long lift lags held in stock by the Department.

- c. Accessory Materials
 - i. Tie Wires
Shall be minimum 16 gauge, PVC coated, annealed, double loop wire ties as manufactured by American Wire Tie, Inc.
 - ii. Bar Supports, Spacers, Etc.
Shall be submitted for approval to the Engineer prior to use.
 - d. Slotted Setting Plugs
Upon delivery of the completed panels the Contractor shall supply 128 plastic slotted setting plugs compatible with approved lifting inserts or approved equal.
4. Fabrication
- a. Reinforcement
 - i. Fabricate all concrete reinforcement in accordance with the Plans.
 - ii. All reinforcement shall be fabricated in full lengths as indicated on the Plans.
 - iii. No welding or splicing of reinforcement is permitted.
5. Placement
- a. Reinforcement
 - i. All reinforcement shall be supported and fastened before concrete is placed and shall be secured against displacement within the tolerances specified on the Plans.
 - ii. Bars shall be tied at all intersections.
 - iii. Conform to Plans for specified concrete cover over reinforcement.
 - iv. The use of pebbles, pieces of broken stone or brick, metal pipe, wooden blocks or any other foreign materials shall not be permitted as spacers or bar supports.
 - b. Lifting Inserts
 - i. Lifting inserts shall be installed two (2) per panel in the locations specified on the Plans.
 - ii. Lifting inserts shall be set perpendicular to the panel surface and securely tied to the rebar mesh.
 - iii. Coils of the inserts shall not extend above the concrete surface and shall meet manufacturer's requirements for development of full tensile and shear strengths.
6. Quality Control
- a. Tolerances, cover and setbacks shall conform to the requirements specified on the Plans and as recommended by the manufacturer.
 - b. All reinforcement, lifting inserts and embedments at the time the concrete is placed, shall be free of mud, oil or other materials that may adversely affect or reduce the bond.
 - c. Field inspections shall be allowed at anytime during the project.
7. References

ACI 315: Details and Detailing of Concrete Reinforcement
ACI 318: Building Code Requirements for Reinforced Concrete
ASTM A615: Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcements
CRSI: Manual of Standard Practice

C. Portland Cement Concrete

1. Submittals

- a. Within ten (10) calendar days of issuance of Notice to Proceed (or Purchase Order) the Contractor shall submit in writing to the Engineer the following for approval:
 - i. A concrete mix design meeting or exceeding the specifications required in Section C.3 - Concrete Specification conforming to the applicable standards referenced in Section C.2. - References: Applicable Standards and Test Methods
 - ii. Submit name and location of sources of cement, aggregates, chemical admixtures, and all other materials (ex. Blast-furnace slag or pozzalana) for use on this project.
 - iii. Curing procedures.

2. References - Applicable Standards and Test Methods

All materials, work and tests referred to and required in this Section shall conform to the standards specified in the latest editions of, and/or addenda to, the following documents:

ACI 301: Specifications for Structural Concrete for Buildings
ACI 304: Recommended Practice for Measuring, Mixing, Transporting and Placing Concrete
ACI 305R: Hot Weather Concreting
ACI 306R: Cold Weather Concreting
ACI 308: Standard Practice for Curing Concrete
ACI 309: Guide for Consolidation of Concrete
ACI 318: Building Code Requirements for Reinforced Concrete
ASTM C 31: Making and Curing Concrete Test Specimens in the Field
ASTM C 33: Standard Specification for Concrete Aggregate
ASTM C 39: Standard Test Method for Compressive Strength of Cylindrical Specimens
ASTM C 42: Standard Method of Obtaining and Testing Drilled Cores and Sawed Beams of Concrete
ASTM C 94: Standard Specification for Ready-Mixed Concrete
ASTM C 138: Standard Test Method Unit Weight, Yield and Air Content (Gravimetric) of Concrete
ASTM C 143: Standard Test Method for Slump of Hydraulic Cement Concrete
ASTM C 150: Standard Specification for Portland Cement
ASTM C 171: Standard Specification for Sheet Materials for Curing Concrete
ASTM C 172: Sampling Freshly Mixed Concrete
ASTM C 173: Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method

ASTM C 231: Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method
ASTM C 260: Standard Specification for Air-Entraining Admixtures for Concrete
ASTM C 309: Standard Specification for Liquid Membrane - Forming Compounds for Curing Concrete
ASTM C 494: Standard Specification for Chemical Admixtures for Concrete
ASTM C 618: Fly Ash and Raw or Calcined Natural Pozzolan for use as a Mineral Admixture in Portland Cement Concrete
ASTM C 989: Standard Specification for Ground Iron Blast-Furnace Slag for Use in Concrete Mortars
ASTM C 1017: Chemical Admixtures for Use in Producing Flowing Concrete
ASTM C 1064: Temperature of Freshly Mixed Portland Cement Concrete
ASTM E 329: Standard Practice for Use in the Evaluation of Testing and Inspection Agencies as Used in Construction
DOT Form 816 (2004): Standard Specification for Roads, Bridges and Incidental Construction and Supplemental Specifications, Special Provisions and addenda.

3. Concrete Specification

Design of concrete shall be based on concrete placed in severe exposure conditions including resistance to freeze-thaw, abrasion, chloride resistance and durability. Concrete shall meet or exceed the following:

- a. Compressive-Strength: f'_c 5000 PSI at 28 days
- b. Water/Cement Ratio (by weight): 0.38 maximum
- c. Slump: 3 inch maximum
NOTE: Where use of superplasticizers are approved to produce flowing concrete the above requirement does not apply.
- d. Portland Cement (ASTM C 150): Type II, min 658 lbs/cy
NOTE: One brand of cement shall be used throughout the project.
- e. Coarse Aggregate (ASTM C 33/DOT Form 816): ½ inch max. (No. 67).
- f. Fine Aggregate (ASTM C 33/DOT Form 816)
- g. Water (ASTM C 94): Potable, clean and not detrimental to concrete
- h. Admixtures:
 - i. Air Entrainment (ASTM C 260 - non-chloride) 7 +/- 1%
 - ii. Chemical Admixtures (ASTM C 494 - non-chloride): As required to provide concrete of the desired quality on-site.
NOTE: All admixtures used throughout the project shall be from one manufacturer.

Note: Contractors can submit a Self-Consolidating Concrete (SCC) Mix for approval.

4. Concrete Field Tests

- a. Procedures for obtaining representative samples of fresh concrete as delivered to the forms on which tests are to be performed to determine compliance with quality requirements of the specifications shall be in accordance with ASTM C 172.

- b. In accordance with ASTM Standards the following tests shall be performed on each batch produced:
 - ASTM C 138: Unit Weight/Yield
 - ASTM C 143: Slump of Hydraulic Cement Concrete
 - ASTM C 231: Air Content of Freshly Mixed Concrete by the Pressure Method
 - ASTM C 1064: Temperature of Freshly Mixed Portland Cement Concrete
 - c. Ambient air temperature shall be recorded at time of each placement.
 - d. Compressive-Strength Tests (ASTM C 39): Cylinders shall be molded and cured throughout the project as follows in conformance with ASTM C 31 and shall be tested by a DOT certified testing facility.
 - i. Four (4) cylinders shall be made each day panels are cast: one (1) tested at 7 days, two (2) tested at 28 days and one (1) spare.
 - ii. Test cylinders shall have identification tags with the following information recorded:
 - a) Date cast
 - b) Concrete batch number
 - c) Results of the field tests
 - iii. If a strength test (the average of 2 cylinders at 28 days) has a compressive strength exceeding 500 PSI below the requirement the Contractor shall provide the following:
 - a) The compressive-strength result(s) from the spare cylinder(s).
 - b) If required, further non-destructive testing of the concrete panels in question based on ASTM C42 (Method of Obtaining and Testing Drilled Cores and Sawed Beams of Concrete) and ACI 318 - Section 4.7 Requirements.
 - c) If the tests are not done or provide inadequate results the panels shall be recast to acceptable standards.
5. Test Placement
- a. Prior to beginning scheduled concrete placement and after approval of the proposed mix proportions, the Contractor shall conduct a test placement of two (2) panels.
 - b. The Contractor shall use the test placements for:
 - i. Demonstrating the placing, consolidating, finishing, evaporation protection, curing mad form stripping, techniques proposed for use on the project.
 - ii. Establishing a time for stripping forms as specified in Section III.A.6 Form Removal.
 - iii. Providing an objective on-site standard for judging the acceptability of the finished panels when observed by the Engineer.
 - c. The Project Manger shall review these techniques and the final finished appearance of the panels.
 - d. Subsequent placements shall not begin until the test placements have been approved by the Engineer.
6. Placement

- a. Notify the Engineer minimum of 24 hours prior to commencement of test placement.
 - b. Place concrete in accordance with ACI 304, ACI 305R and ACI 306R.
 - c. Deposit and consolidate concrete in a continuous operation until the placing of a panel is completed.
 - d. Deposit concrete continuously or in layers of such thickness that no concrete shall be placed on concrete which has hardened sufficiently to cause the formation of cold joints, seams or planes of weakness.
 - e. Deposit concrete, as nearly as practicable, to its final location to avoid segregation.
 - f. Do not interrupt successive placements.
 - g. Do not permit cold joints to occur.
7. Consolidation
 - a. Consolidate concrete in accordance with ACI 309.
 - b. Concrete shall be vibrated either externally or internally to achieve maximum density concrete.
8. Finish
 - a. Surface finish of panels shall conform to the dimensions detailed on the Plans.
 - b. Immediately after form removal concrete shall be repaired and cleaned as follows:
 - i. All concrete surfaces shall have bugholes and honeycomb areas patched.
 - ii. Any bulges or offsets which shall interfere with the proper setting of the panels shall be leveled to correct dimension.
 - iii. All exposed edges shall have fins carefully removed and all rough spots, mortar, grout or other projections rubbed with a carborundum or abrasive stone to provide a smooth, even finish.
 - iv. All stains shall be removed.
 - c. The date cast (mm/dd/yy) shall be stenciled on at least one end of each panel.
9. Patching and/or Repair of Concrete
 - a. No patching or pointing of concrete work shall be done until the work has been examined by the Engineer.
 - b. Patching material shall be a proprietary cementitious non-shrink grout of similar color as approved by the Engineer.
 - c. A sample patch of grout shall be required to insure blending with the adjacent concrete.
10. Curing and Protection
 - a. Curing of concrete shall be in conformance with ACI 308.
 - b. Immediately after placement protect concrete from premature drying, excessive hot or cold temperatures and mechanical injury.
 - c. Panels shall be cured with the approved curing method for a minimum of seven (7) days.
 - d. Maintain concrete with minimal moisture loss at relatively constant temperature for designated curing period.

- e. Approved liquid curing and evaporative agents shall be compatible with the agents and shall be applied in conformance with the manufacturer's recommendations.

11. Handling, Storage and Transportation

- a. The location of the lifting inserts (pickup points) for handling of members shall be in accordance with the Plans.
- b. Panels shall be handled only by means of approved devices at designated locations.
- c. Storage areas for the precast panels shall be stabilized and a suitable foundation provided, so that differential settlement or twisting of panels will not occur.
- d. Stacked members shall be separated and supported by battens placed across the full width of each bearing point.
 - i. Battens shall be arranged in vertical planes at a distance not greater than the depth of the member from designated pickup point (or directly over lifting insert locations).
 - ii. Batten material shall be carefully selected to avoid staining.
 - iii. When stacking panels, battens shall not be continuous over more than one stack of precast panels.
 - iv. Panels shall not be staked over five (5) panels high.
- e. When transporting panels provision shall be made for supporting the panels as described above.
 - i. Stacks shall be braced to ensure they remain vertical and to dampen "dangerous" vibrations.
 - ii. Adequate padding material shall be provided between the concrete panels and tie chains, cables or straps to prevent abrading or chipping of concrete.
- f. The Engineer is to be notified 48 hours in advance of any panel delivery.

Method of Measurement: This item shall be paid on a Square Foot basis, as such, will not be separately measured for payment.

Basis of Payment: Payment for this item will be included in the contract square foot price for "Precast Concrete Boat Launch Panels" installed, of the size and shape indicated, as shown on the plans, complete and accepted, which price shall include, all reinforcing, threaded inserts, lifting and seating inserts, fixtures and devices, void forms, non-shrink grout, and all other necessary hardware, materials, equipment, tools and labor incidental thereto.

The contract square foot price for "Precast Concrete Boat Launch Panels" shall also include the costs of preparing and furnishing design calculations, working drawings, and shop drawings.

<u>Pay Item</u>	<u>Pay Unit</u>
Precast Concrete Boat Launch Panels	S.F.

ITEM #43- PRECAST CONCRETE INTERLOCKING BLOCKS

Description: The contractor shall furnish all labor, materials, equipment, and incidentals required and perform all operations in connection with the installation of precast concrete interlocking blocks in accordance with the lines, grades, design and dimensions shown on the Plans and as specified herein or as ordered by the Engineer.

The Contractor shall submit to the Engineer all manufacturers' calculations in support of the proposed precast concrete interlocking block system.

The Contractor shall furnish the manufacturer's certificates of compliance for precast concrete interlocking blocks. The Contractor shall also furnish the manufacturer's specifications, literature and any recommendations, if applicable, that are specifically related to the project.

Materials: The precast concrete interlocking blocks shall be AmorLoc precast concrete interlocking blocks 4511 by Contech Engineering Solutions or approved equal.

Cementitious Materials - Materials shall conform to the following applicable ASTM specifications:

- a. Portland Cements - Specification C 150, for Portland Cement.
- b. Blended Cements - Specification C 595, for Blended Hydraulic Cements.
- c. Hydrated Lime Types - Specification C 207, for Hydrated Lime Types.
- d. Pozzolans - Specification C 618, for Fly Ash and Raw or Calcined Natural Pozzolans for use in Portland Cement Concrete.

Aggregates shall conform to the following ASTM specifications, except that grading requirements shall not necessarily apply:

- a. Normal Weight - Specification C 33, for Concrete Aggregates.

Construction Methods: Placement and preparation should be performed with *ASTM D6884-03, Standard Practice for Installation of Articulating Concrete Block (ACB) Revetment Systems*.

Placement: The precast concrete interlocking blocks will be prepared subgrade in such a manner as to produce a smooth plane surface in intimate contact. No individual block within the plane of placed precast concrete interlocking blocks will protrude more than one-half inch or as otherwise specified by the Engineer. Precast concrete interlocking blocks should be flush and develop intimate contact with the subgrade section, as approved by the Engineer.

Anchor trenches and side trenches shall be backfilled and compacted flush with the top of the blocks. The integrity of a soil trench backfill must be maintained so as to ensure a surface that is flush with the top surface of the precast concrete interlocking blocks for its entire service life.

Toe trenches shall be backfilled as shown on the Contract Drawings. Backfilling and compaction of trenches shall be completed in a timely fashion.

Finishing: The cells or openings in the precast concrete interlocking blocks will be backfilled and compacted with suitable material, as specified by the Engineer.

Finishing requirements is explicitly at the discretion of the Engineer of Record.

Consultation: The manufacturer of the precast concrete interlocking blocks will provide design and construction advice during the design and initial installation phases of the project as necessary, by the discretion of the Engineer.

Casting: The concrete units shall be produced by a dry cast method. The dry cast units obtain strength in a shorter duration as well as an increase in the durability and overall quality of product.

Physical Requirements: At the time of delivery to the work site, the units shall conform to the physical requirements prescribed in Table 1 below.

TABLE 1. ARMORLOC® PHYSICAL REQUIREMENTS

Compressive Strength Net Area Min. psi (MPa)		Water Absorption Max., lb/ft ³ (Kg/m ³)	
Avg. of 3 units	Individual Unit	Avg. of 3 units	Individual Unit
4,000 (27.6)	3,500 (24.1)	9.1 (160)	11.7 (192)

Units will be sampled and tested in accordance with *ASTM D 6684-04, Standard Specification for Materials and Manufacture of Articulating Concrete Block (ACB) Revetment Systems*.

Units shall be sampled and tested in accordance with *ASTM D 6684-04, Standard Specification for Materials and Manufacture of Articulating Concrete Block (ACB) Revetment Systems*.

Visual Inspection: All units shall be sound and free of defects that would interfere with either the proper placement of the unit or impair the performance of the system. Surface cracks incidental to the usual methods of manufacture, or surface chipping resulting from customary methods of handling in shipment and delivery, shall not be deemed grounds for rejection.

Cracks exceeding 0.25 inches (.635 cm) in width and/or 1.0 inch (2.54 cm) in depth shall be deemed grounds for rejection.

Chipping resulting in a weight loss exceeding 10% of the average weight of a concrete unit shall be deemed grounds for rejection.

Blocks rejected prior to delivery from the point of manufacture shall be replaced at the manufacturer's expense. Blocks rejected at the job site shall be repaired with structural grout or replaced at the expense of the contractor.

Sampling and Testing: The purchaser or their authorized representative shall be accorded proper access to facilities to inspect and sample the units at the place of manufacture from lots ready for delivery.

Field installation procedures shall comply with the procedures utilized during the hydraulic testing procedures of the recommended system. All system restraints and ancillary components (such as synthetic drainage mediums) shall be employed as they were during testing. For example, if the hydraulic testing installations utilize a drainage layer then the field installation must utilize a drainage layer; an installation without the drainage layer would not be permitted.

The theoretical force-balance equation used for performance extrapolation tends for conservative performance values of thicker concrete units based on actual hydraulic testing of thinner units. When establishing performance values of thinner units based on actual hydraulic testing of thicker units, there is a tendency to overestimate the hydraulic performance values of the thinner units. Therefore, all performance extrapolation must be based on actual hydraulic testing of a thinner unit then relating the values to the thicker units in the same "family" of blocks.

Additional testing, other than that provided by the manufacturer, shall be borne by the purchaser.

Method of Measurement: This work shall be measured for payment by the number of square feet complete and accepted of precast concrete interlocking blocks.

Basis of Payment: This work shall be paid for at the contract unit price per square foot for "precast concrete interlocking blocks" complete in place, which price shall include all material, tools, equipment, and labor incidental thereto.

ITEM #47- TURF ESTABLISHMENT

Work under this item shall conform to the requirements of Section 9.50 of the State of Connecticut Department of Transportation Standard Specifications for Roads, Bridges and Incidental Construction Form 816, amended as follows:

Materials: Delete Section 9.50.02 and replace with the following:

The materials for this work shall conform to the requirements of Section M.13 of the contract documents.

Construction Methods:

Preparation of Seedbed: Add the following before the first paragraph of Section 9.50.03-1:

Where topsoil is not required the seedbed shall be free from refuse, stumps, roots, brush, weeds, rocks, and stones over 1 1/4 inches (30 millimeters) in diameter. If “Out-of-Season” seeding is required then the seedbed will need to be prepared again prior to final turf establishment.

Seeding Season: Delete Section 9.50.03-2(b) and replace with the following:

(b) “Out-of-Season” seeding shall be done in accordance with section M.13.04 (b) “temporary” seeding and seeded at the rate of 50lbs/acre (56kg./hectare). Turf establishment can only be performed during the seeding season or as approved by a member of the Landscaping Design Unit or the Office of Environmental Planning.

Method of Measurement: Delete the entire first paragraph of Section 9.50.04 and replace with the following:

This work will be measured for payment by the number of square yards (square meters) of surface area of accepted established native roadside turf as specified or by the number of square yards (square meters) surface area of seeding actually covered and as specified.

ITEM #48- CONSTRUCTION FIELD OFFICE (SMALL)

Description: Under this item, adequate weatherproof office quarters shall be provided by the Contractor for the duration of the work, and if required, for a maximum of ninety days thereafter for the exclusive use of State of Connecticut Department of Energy and Environmental Protection (DEEP) forces and others who may be engaged to augment DEEP forces with relation to the contract. The office quarters shall be located convenient to the work site and installed in accordance with Article 1.08.02, this office shall be separated from any office occupied by the Contractor. Ownership and liability of the office quarters shall remain with the Contractor.

Materials: Materials shall be in like new condition for the purpose intended and shall be approved by the Engineer.

Office Requirements: This office shall have a minimum of 150 sq. ft. of floor space and a minimum ceiling height of 7 ft. and shall be partitioned as shown on building floor plan as provided by the Engineer.

Windows shall be of a type that will open and close conveniently, shall be sufficient in number and size to provide adequate light and ventilation, and shall be fitted with locking devices, blinds and screens. The entrance shall be secure, screened, fitted with a lock for which four keys shall be furnished. All keys to the construction field office shall be furnished to the DEEP and will be kept in their possession while the office is being used by DEEP personnel.

The Contractor shall furnish lavatory and toilet facilities at a location convenient to the office quarters for the use of DEEP personnel and such assistants as they may engage. He shall also supply lavatory and sanitary supplies as required.

The Contractor shall equip the office interior with electric lighting that provides a minimum illumination level of 100 foot-candles at desk level height, and electric outlets for each desk and drafting table. The Contractor shall also provide exterior lighting that provides a minimum illumination level of 2 foot-candles throughout the parking area and for a minimum distance of 10 ft. on each side of the field office. If the field office space provided is in a permanent commercial structure, the external illumination requirements will not apply.

The Contractor shall provide the following additional equipment, facilities, and/or services at the Field Office on this project to include at least the following to the satisfaction of the Engineer:

Parking Facility: The Contractor shall provide adequate parking spaces for four vehicles on a paved surface, with surface drainage if needed. If paved parking does not exist adjacent to the field office, the Contractor shall provide a parking area of sufficient size to accommodate seven vehicles. Construction of the parking area and driveway, if necessary, will consist of a minimum of 6 inches of processed aggregate base graded to drain. The base material will be extended to the office entrance.

Field Office Security: Physical Barrier Devices - This shall consist of physical means to prevent entry, such as: 1) All windows shall be barred or security screens installed; 2) All field office doors

shall be equipped with dead bolt locks and regular day operated door locks; and 3) Other devices as directed by the Engineer to suit existing conditions.

Electric Service: The field office shall be equipped with an electric service panel to serve the electrical requirements of the field office, including: lighting, general outlets, computer outlets, calculators etc., and meet the following minimum specifications:

- A. 120/240 volt, 1 phase, 3 wire.
- B. Ampacity necessary to serve all equipment. Service shall be a minimum 100 amp dedicated to the construction field office.
- C. The electrical panel shall include a main circuit breaker and branch circuit breakers of the size and quantity required.
- D. Additional 120 volt, single phase, 20 amp, isolated ground dedicated power circuit with dual NEMA 5-20 receptacles shall be installed at each computer workstation location.
- E. Additional 120 volt, single phase, 20 amp, isolated ground dedicated power circuit with dual NEMA 5-20 receptacles shall be installed, for use by the Telephone Company.
- F. Additional 120-volt circuits and duplex outlets as required meeting National Electric Code requirements.
- G. One exterior (outside) wall mounted GFI receptacle, duplex, isolated ground, 120 volt, straight blade.
- H. After work is complete and prior to energizing, the Town's electrical inspector must be contacted.
- I. Prior to field office removal the DEEP must be notified to deactivate the communications equipment.

Heating, Ventilation and Air Conditioning (HVAC): The field office shall be equipped with sufficient heating, air conditioning and ventilation equipment to maintain a temperature range of 68°-80° Fahrenheit within the field office.

Telephone Service: This shall consist of the installation of two (2) telephone lines: one (1) line for phone/voice service and one (1) line dedicated for the facsimile machine. The Contractor shall pay all charges except for out-of-state toll calls made by DEEP personnel.

Data Communications Facility Wiring: Contractor shall install a Category 5e 468B patch panel in a central wiring location and Cat 5e cable from the patch panel to each PC station, terminating in a (category 5e 468B) wall or surface mount data jack. The central wiring location shall also house either the data circuit with appropriate power requirements or a category 5 cable run to the location of the installed data circuit. Contractor to run a CAT 5e LAN cable a minimum length of 25 feet for each computer to LAN switch area leaving an additional 10 feet of cable length on each side with terminated RJ45 connectors. Each run/jack shall be clearly labeled with an identifying Jack Number.

The Following Furnishings Shall Be Provided In The Field Office:

- 1 - Suitable office desk with drawers, locks, and matching desk chair that have pneumatic seat height adjustment and dual wheel casters on the legs or base.
- 1 - Office chair.

- 1 - Fire resistant cabinets (legal size/4 drawer), locking.
- 1 - Drafting, type table - 3 ft x 6 ft and supported by wall brackets and legs.
- 1 - Drafters' stool.
- 1 - Personal computer table - 4 ft x 2.5 ft size and quality for the purpose intended.
- 1 - Hot and cold water dispensing unit and supply of cups and bottled water shall be supplied by the Contractor for the duration of the project.
- 1 - Electronic office type printing calculators capable of addition, subtraction, multiplication and division with memory and a supply of printing paper.
- 1 - Telephone.
- 1 - Telephone answering machine.
- 1 - Plain paper facsimile (FAX) machine capable of transmitting via telephone credit card, as well as one (1) 5,000 sheet box of fax paper per calendar year or portion thereof and maintenance shall be provided by the Contractor.
- 1 - Computer systems as specified below under Computer Hardware and Software.
- 1 - Laser printer and supplies as specified below under Computer Hardware and Software.
- 1 - Digital Camera and supplies as specified below under Computer Hardware and Software.
- 2 - Wastebaskets - 5 gal.
- 1 - Electric pencil sharpener.
- * - Fire extinguishers - provide and install type and number to meet applicable State and local codes for size of office indicated, including a fire extinguisher suitable for use on a computer terminal fire.
- 1 - Vertical plan rack for 2 sets of 2 ft x 3 ft plans for each rack.

The furnishings and equipment required herein shall remain the property of the Contractor. Any supplies required to maintain or operate the above listed equipment or furnishings shall be provided by the Contractor for the duration of the project.

Computer Hardware and Software:

Before ordering the computer hardware and software, the Contractor must provide a copy of their proposed PC specifications to the DEEP Project Engineer for review. If the specification meets or exceeds the minimum specifications listed below, then the Contractor will be notified that the order may be placed.

All software, hardware and licenses listed below shall be clearly labeled, specifying the (1) Project No., (2) Contractor Name, (3) Project Engineer's Name and (4) Project Engineer's Phone No. Installation will then be coordinated with field personnel and the computer system specified will be stationed in the DEEP's project field office.

The computer system furnished shall have all software and hardware necessary for the complete installation of the latest versions of the software listed, and therefore supplements the minimum specifications below. The Engineer reserves the right to expand or relax the specification to adapt to the software and hardware limitations and availability, the compatibility with current agency systems, and to provide the DEEP with a computer system that can handle the needs of the project. This requirement is to ensure that the rapid changing environment that computer systems have experienced does not leave the needs of the project orphan to what has been

specified. There will not be any price adjustment due to the change in the minimum system requirements.

The Contractor shall provide the Engineer with a licensed copy registered in the DEEP's name of the latest versions of the software listed and maintain customer support services offered by each software producer for the duration of the Contract. The Contractor shall deliver to the Engineer all supporting documentation for the software and hardware including any instructions or manuals. The Contractor shall provide original backup media for the software.

The Contractor shall provide the computer system with all required maintenance and repairs (including labor and parts) throughout the Contract life.

Once the Contract has been completed, the computer will remain the property of the Contractor. Prior to the return of any computer(s) to the Contractor, field personnel will coordinate for the removal of DEEP owned equipment, software, data, and associated equipment.

A) Computer – Minimum Specification:

Processor – Intel® Core 2 Duo Processor (2.00 GHz, 800 MHz FSB 2MB L2 Cache)

Memory – 2 GB DIMM DDR2 667MHz.

Monitor – 19.0 inch LCD color monitor.

Graphics – Intel Graphics Media Accelerator 3100. or equivalent.

Hard Drive – 160 GB Ultra ATA hard drive (Western Digital, IBM or Seagate).

Floppy Drive – 3.5 inch 1.44MB diskette drive.

Optical Drive – CD-RW/DVD-RW Combo.

Multimedia Package – Integrated Sound Blaster Compatible AC97 Sound and speakers.

Case – Small Form or Mid Tower, capable of vertical or horizontal orientation.

Integrated Network Adapter – comparable to 3COM PCI 10/100 twisted pair Ethernet.

Keyboard – 104+ Keyboard.

Mouse – Optical 2-button mouse with scroll wheel.

Operating System – Windows XP Professional Service Pack 2; Windows Vista Capable.

Application Software – MS Office 2007 Professional Edition.

Additional Software (Latest Releases, including subscription services for the life of the Contract.–

- Norton Anti-Virus and CD/DVD burning software (ROXIO or NERO),
- Adobe Acrobat Standard

Resource or Driver CD/DVD – CD/DVD with all drivers and resource information so that computer can be restored to original prior to shipment back to the contractor.

Uninterrupted power supply – APC Back-UPS 500VA.

Note A1: All hardware components must be installed before delivery. All software documentation and CD-ROMs/DVD for Microsoft Windows XP Professional, Microsoft Office 2007 Professional Edition, and other software required software must be provided. Computer Brands are limited to Dell, Gateway and HP brands only. No other brands will be accepted.

Note A2: As of June 30, 2008, Microsoft will no longer distribute Windows XP for retail sale, although the date for specific computer manufacturers may be different. Please consult your manufacturer for details. The Department still requires Windows XP on all PCs. Microsoft has stated that any PCs that are purchased with either Windows Vista Business, or Vista Ultimate are automatically entitled to “downgrade rights”, which allow the PC to be rolled back to Windows XP. Please consult the specific manufacturer for details on downgrading new PCs to Microsoft Windows XP after June 30, 2008.

A) Laser Printer – Minimum Specification:

Print speed – 20 ppm.

Resolution – 1,200 x 1,200 dpi.

Paper size – Up to 216 mm x 355 mm (8.5 in x 14 in).

RAM – 16 MB.

Print Drivers – Must support HP PCL6 and HP PCL5e.

Printer cable – 1.8 m (6 ft).

Note B1: Laser printer brands are limited to Hewlett-Packard and Savin brands only.

Note B2: It is acceptable to substitute a multi-function all-in-one printer/copier/scanner/fax machine listed on the approved printer list in place of the required laser printer and fax machine.

B) Digital Camera – Minimum Specification:

Optical – 5 mega pixel, with 3x optical zoom.

Memory – 2 GB.

Features – Date/time stamp feature.

Connectivity – USB cable or memory card reader.

Software – Must be compatible with Windows XP and Vista.

Power – Rechargeable battery and charger.

The Contractor is responsible for service and repairs to all computer hardware. All repairs must be performed with-in 24 hours. If the repairs require more than a 24 hours then a replacement must be provided.

Insurance Policy: The Contractor shall provide a separate insurance policy, with no deductible, in the amount of twenty thousand dollars (\$20,000.00), in order to insure all DEEP-owned data equipment and supplies used in the office, against all losses. The Contractor shall be named insured on that policy, and the DEEP shall be an additional named insured on the policy. These losses shall include, but not be limited to: theft, fire, and physical damage. The DEEP will be responsible for all maintenance costs of DEEP owned computer hardware. In the event of loss, the Contractor shall provide replacement equipment in accordance with current DEEP equipment specifications, within seven days of notice of the loss. If the Contractor is unable to provide the required replacement equipment within seven days, the DEEP may provide replacement equipment and deduct the cost of the equipment from monies due or which may become due the Contractor under the contract or under any other contract. The Contractor's financial liability under this paragraph shall be limited to the amount of the insurance coverage required by this paragraph. If the cost of equipment

replacement required by this paragraph should exceed the required amount of the insurance coverage, the DEEP will reimburse the Contractor for replacement costs exceeding the amount of the required coverage.

Maintenance: During the occupancy by the DEEP, the Contractor shall maintain all facilities and furnishings provided under the above requirements, and shall maintain and keep the office quarters and surrounding area clean at all times. Exterior areas shall be mowed and cleaned of debris. A trash receptacle (dumpster) with weekly pickup (trash removal) shall be provided. Snow removal, sanding and salting of all parking and walkway areas shall be accomplished during a storm if on a workday during work hours, immediately after a storm and prior to the start of a workday. If snow removal, salting and sanding are not completed by the specified time, the DEEP will provide the service and all costs incurred will be deducted from the next payment estimate.

Method of Measurement: The furnishing and maintenance of the construction field office will be measured for payment by the number of calendar months that the office is in place and in operation, measured to the nearest month.

Basis of Payment: The furnishing and maintenance of the construction field office will be paid at the listed unit price per month for "Construction Field Office (Small)", which price shall include all material, equipment, labor, utility services and work incidental thereto.

The cost of providing the parking area, external illumination, trash removal and snow and ice removal shall be included in the monthly unit price bid for the item "Construction Field Office (Small)".

The DEEP will be responsible for payment of data communication user fees and for toll calls by DEEP personnel.

ITEM #49- MAINTENANCE AND PROTECTION OF TRAFFIC

Work under this item shall conform to the requirements of Section 9.71 of the State of Connecticut Department of Transportation Standard Specifications for Roads, Bridges and Incidental Construction Form 816 amended as follows:

9.71.01 - Description: is supplemented by the following:

SIGN PATTERN - ALLOWABLE ADJUSTMENT OF SIGNS AND DEVICES SHOWN ON TRAFFIC CONTROL PATTERNS:

Adjustments to the signing plan will be made only by the Engineer or his designee. The signing pattern is to be installed, as directed by the Engineer, to consider abutting properties, driveways, side roads, and the vertical and horizontal curvature of the roadway.

If adjustments are made to the sign pattern, the adjustments shall always be to improve the visibility of the signs and devices and to better control traffic. The Engineer may require that the signs be located significantly in advance of the construction work site, in order to provide better sightline to the signs and safer traffic operations around the work zone. The Engineer may order the spacing between the signs and devices to be increased or decreased as conditions dictate.

Any adjustments in the sign pattern installed for traffic control shall be done by the Contractor's forces and shall be at no additional cost to DEEP. The Engineer may order that additional signs or devices be installed. Additional signs or devices that may be required will be paid for at the contract unit price for that item.

PAVEMENT MARKINGS:

The Contractor will be responsible for the furnishing of all pavement markings, either temporary or permanent. He shall paint and/or repaint roadways as called for on the plans or as directed by the Engineer. This work will be paid for under the appropriate item.

BARRIERS:

Construction Barricades are to be installed at locations shown on the contract plans or as ordered by the Engineer. Additional locations for these along with locations for other devices may be required by the Engineer in order to protect traffic from the work area. The Contractor shall furnish and place all barriers, barricades, drums, etc., as directed by the Engineer. This work will be paid for under the specified contract items, or if no specific pay items exist in the Contract, they shall be considered to be included in the cost of the item: "Maintenance and Protection of Traffic."

EXISTING SIGNS:

The Contractor shall utilize existing signs and supports, delineators, warning and guide signs during the construction of the project where shown on the plans or as directed by the Engineer.

This shall also include the relocating of existing signs and supports, delineators, regulatory, warning and guide signs as many times as deemed necessary for the construction.

Any existing signs that are in conflict with the traffic control patterns shall be removed, covered, or turned so that they are not readable by oncoming traffic.

REQUIRED TRAFFIC OPERATIONS:

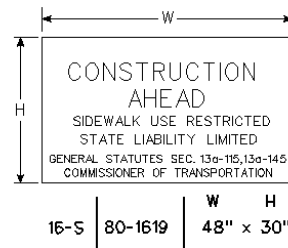
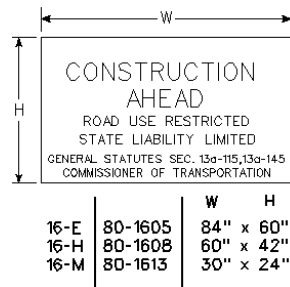
The Contractor shall maintain and protect traffic in accordance with Section 1.08 of the Standard Specifications, "Prosecution and Progress" and any associated special provisions, and in accordance with the following:

During normal working hours, the Contractor shall make every attempt necessary to provide and maintain two lanes of bi-directional traffic along Bashan Road through the project area for the full duration of the project until approved unfeasible by the Engineer in the field. When not feasible, the Contractor may be permitted to provide one-way alternating traffic. During times of one-way alternating traffic, the Contractor shall furnish all maintenance of traffic control devices including, but not limited to construction signs, traffic drums, traffic cones, flashers and flag persons, and uniformed officers as required by these specifications. Maintenance and protection of traffic shall be provided during such periods by construction signs and devices shown on Traffic Control Plans, and maintenance and protection of traffic plans, as approved by the Engineer. Two lanes of traffic shall be maintained during evenings, weekends and non-working hours.

Prior to working in the road, the Contractor must install advance warning signing and site protection devices according to the plans and specifications, and as directed and approved by the Engineer.

Specific attention is made to the fact that access to all driveways must be maintained at all times unless special arrangements have been made, and approved by the Engineer, with the property owners.

Although each situation must be dealt with individually, conformity with the typical traffic control plans contained herein is required. In a situation not adequately covered by the typical traffic control plans, the Contractor must contact the Engineer for assistance prior to setting up a traffic control pattern.

SERIES 16 SIGNS

THE 16-S SIGN SHALL BE USED ON ALL PROJECTS THAT REQUIRE SIDEWALK RECONSTRUCTION OR RESTRICT PEDESTRIAN TRAVEL ON AN EXISTING SIDEWALK.

SERIES 16 SIGNS SHALL BE INSTALLED IN ADVANCE OF THE TRAFFIC CONTROL PATTERNS TO ALLOW MOTORISTS THE OPPORTUNITY TO AVOID A WORK ZONE. SERIES 16 SIGNS SHALL BE INSTALLED ON ANY MAJOR INTERSECTING ROADWAYS THAT APPROACH THE WORK ZONE. ON LIMITED- ACCESS HIGHWAYS, THESE SIGNS SHALL BE LOCATED IN ADVANCE OF THE NEAREST UPSTREAM EXIT RAMP AND ON ANY ENTRANCE RAMPS PRIOR TO OR WITHIN THE WORK ZONE LIMITS.

THE LOCATION OF SERIES 16 SIGNS CAN BE FOUND ELSEWHERE IN THE PLANS OR INSTALLED AS DIRECTED BY THE ENGINEER.

SIGNS 16-E AND 16-H SHALL BE POST MOUNTED.

SIGN 16-E SHALL BE USED ON ALL EXPRESSWAYS.

SIGN 16-H SHALL BE USED ON ALL RAMPS, OTHER STATE ROADWAYS, AND MAJOR TOWN/CITY ROADWAYS.

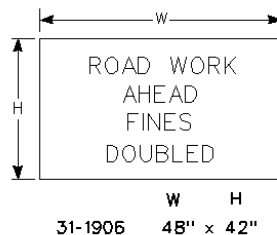
SIGN 16-M SHALL BE USED ON OTHER TOWN ROADWAYS.

REGULATORY SIGN "ROAD WORK AHEAD, FINES DOUBLED"

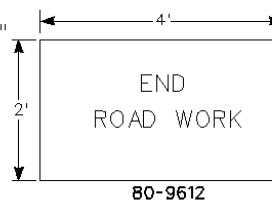
THE REGULATORY SIGN "ROAD WORK AHEAD, FINES DOUBLED" SHALL BE INSTALLED FOR ALL WORK ZONES THAT OCCUR ON ANY STATE HIGHWAY IN CONNECTICUT WHEN THERE ARE WORKERS ON THE HIGHWAY OR WHEN THERE IS OTHER THAN EXISTING TRAFFIC OPERATIONS.

THE "ROAD WORK AHEAD, FINES DOUBLED" REGULATORY SIGNS SHALL NOT BE INSTALLED ON TOWN ROADS.

THE "ROAD WORK AHEAD FINES DOUBLED" REGULATORY SIGN SHALL BE PLACED AFTER THE SERIES 16 SIGN AND IN ADVANCE OF THE "ROAD WORK AHEAD" SIGN.

**"END ROAD WORK" SIGN**

THE LAST SIGN IN THE PATTERN MUST BE THE "END ROAD WORK" SIGN.



REV'D I-02



CONNECTICUT
DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING &
HIGHWAY OPERATIONS
DIVISION OF TRAFFIC ENGINEERING

CONSTRUCTION
TRAFFIC CONTROL PLAN
REQUIRED SIGNS

APPROVED J. Carey DATE I-02
PRINCIPAL ENGINEER

NOTES FOR TRAFFIC CONTROL PLANS

1. IF A TRAFFIC STOPPAGE OCCURS IN ADVANCE OF SIGN (A), THEN AN ADDITIONAL SIGN (A) SHALL BE INSTALLED IN ADVANCE OF THE STOPPAGE.
2. SIGNS (AA), (A) AND (D) SHOULD BE OMITTED WHEN THESE SIGNS HAVE ALREADY BEEN INSTALLED TO DESIGNATE A LARGER WORK ZONE THAN THE WORK ZONE THAT IS ENCOMPASSED ON THIS PLAN.
3. SEE TABLE #1 FOR ADJUSTMENT OF TAPERS IF NECESSARY.
4. A CHANGEABLE MESSAGE SIGN MAY BE UTILIZED ONE HALF TO ONE MILE IN ADVANCE OF THE LANE CLOSURE TAPER.
5. IF THIS PLAN REMAINS IN CONTINUOUS OPERATION FOR MORE THAN 72 HOURS, THEN TRAFFIC DRUMS SHALL BE USED IN PLACE OF TRAFFIC CONES.
6. ANY LEGAL SPEED LIMIT SIGNS WITHIN THE LIMITS OF A ROADWAY / LANE CLOSURE AREA WILL BE COVERED WITH AN OPAQUE MATERIAL WHILE THE CLOSURE IS IN EFFECT AND UNCOVERED WHEN THE ROADWAY / LANE CLOSURE IS REOPENED TO ALL LANES OF TRAFFIC.
7. IF THIS PLAN REMAINS IN CONTINUOUS OPERATION FOR MORE THAN 36 HOURS, THEN THE EXISTING CONFLICTING PAVEMENT MARKINGS SHALL BE ERADICATED OR COVERED AND TEMPORARY PAVEMENT MARKINGS THAT DEPICT THE PROPER TRAVEL PATHS SHALL BE INSTALLED.
8. DISTANCES BETWEEN SIGNS IN THE ADVANCE WARNING AREA MAY BE REDUCED TO 200' ON LOW SPEED URBAN ROADS (SPEED LIMIT < 40 MPH).
9. FOR LANE CLOSURES ONE (1) MILE OR LONGER, A "REDUCE SPEED TO 45 MPH" SIGN SHALL BE PLACED AT THE ONE MILE POINT AND AT EACH MILE THEREAFTER.
10. IF THIS PLAN IS TO REMAIN IN OPERATION DURING THE HOURS OF DARKNESS, INSTALL BARRICADE WARNING LIGHTS - HIGH INTENSITY ON ALL POST-MOUNTED DIAMOND SIGNS IN THE ADVANCE WARNING AREA.
11. A CHANGEABLE MESSAGE SIGN SHALL BE INSTALLED ONE HALF TO ONE MILE IN ADVANCE OF THE LANE CLOSURE TAPER.

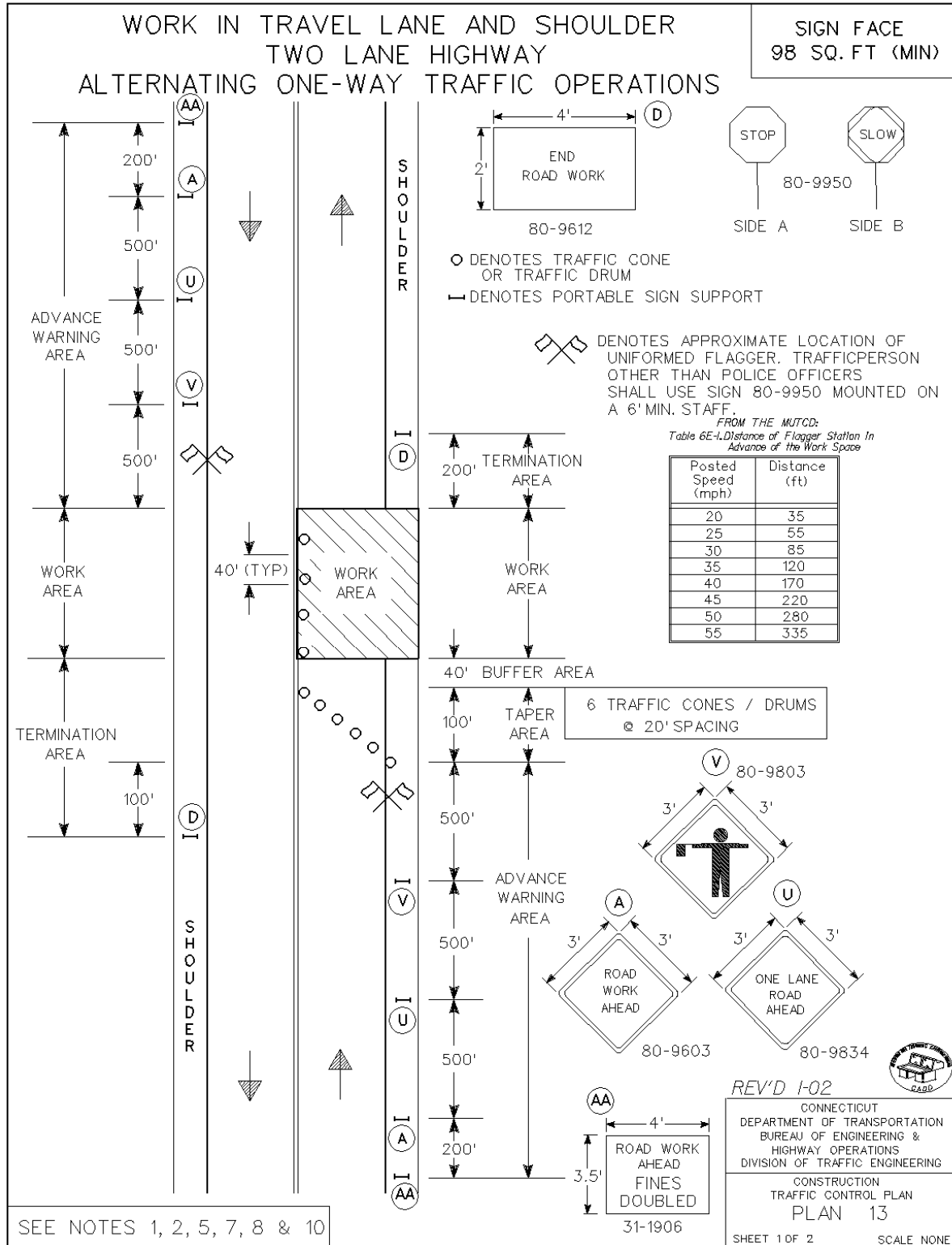
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CONNECTICUT
DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING &
HIGHWAY OPERATIONS
DIVISION OF TRAFFIC ENGINEERING

CONSTRUCTION
TRAFFIC CONTROL PLAN
NOTES

NOTES.DGN



APPROVED J. Carey DATE 1-02
PRINCIPAL ENGINEER

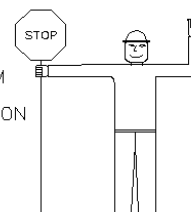
WORK IN TRAVEL LANE AND SHOULDER TWO LANE HIGHWAY ALTERNATING ONE-WAY TRAFFIC OPERATIONS

HAND SIGNAL METHODS TO BE USED BY UNIFORMED FLAGGERS

THE FOLLOWING METHODS FROM SECTION 6E.04 FLAGGER PROCEDURES IN THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" SHALL BE USED BY UNIFORMED FLAGGERS WHEN DIRECTING TRAFFIC THROUGH A WORK AREA. THE STOP/SLOW SIGN PADDLE (SIGN NO. 80-9950) SHOWN ON THE TYPICAL DETAIL SHEET ENTITLED "SIGNS FOR CONSTRUCTION AND PERMIT OPERATIONS" SHALL BE USED.

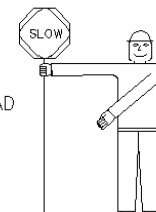
A. TO STOP TRAFFIC

TO STOP ROAD USERS, THE FLAGGER SHALL FACE ROAD USERS AND AIM THE STOP PADDLE FACE TOWARD ROAD USERS IN A STATIONARY POSITION WITH THE ARM EXTENDED HORIZONTALLY AWAY FROM THE BODY. THE FREE ARM SHALL BE HELD WITH THE PALM OF THE HAND ABOVE SHOULDER LEVEL TOWARD APPROACHING TRAFFIC.



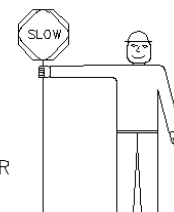
B. TO DIRECT TRAFFIC TO PROCEED

TO DIRECT STOPPED ROAD USERS TO PROCEED, THE FLAGGER SHALL FACE ROAD USERS WITH THE SLOW PADDLE FACE AIMED TOWARD ROAD USERS IN A STATIONARY POSITION WITH THE ARM EXTENDED HORIZONTALLY AWAY FROM THE BODY. THE FLAGGER SHALL MOTION WITH THE FREE HAND FOR ROAD USERS TO PROCEED.



C. TO ALERT OR SLOW TRAFFIC

TO ALERT OR SLOW TRAFFIC, THE FLAGGER SHALL FACE ROAD USERS WITH THE SLOW PADDLE FACE AIMED TOWARD ROAD USERS IN A STATIONARY POSITION WITH THE ARM EXTENDED HORIZONTALLY AWAY FROM THE BODY. TO FURTHER ALERT OR SLOW TRAFFIC, THE FLAGGER HOLDING THE SLOW PADDLE FACE TOWARD ROAD USERS MAY MOTION UP AND DOWN WITH THE FREE HAND, PALM DOWN.



SEE NOTES 1, 2, 5, 7, 8 & 10

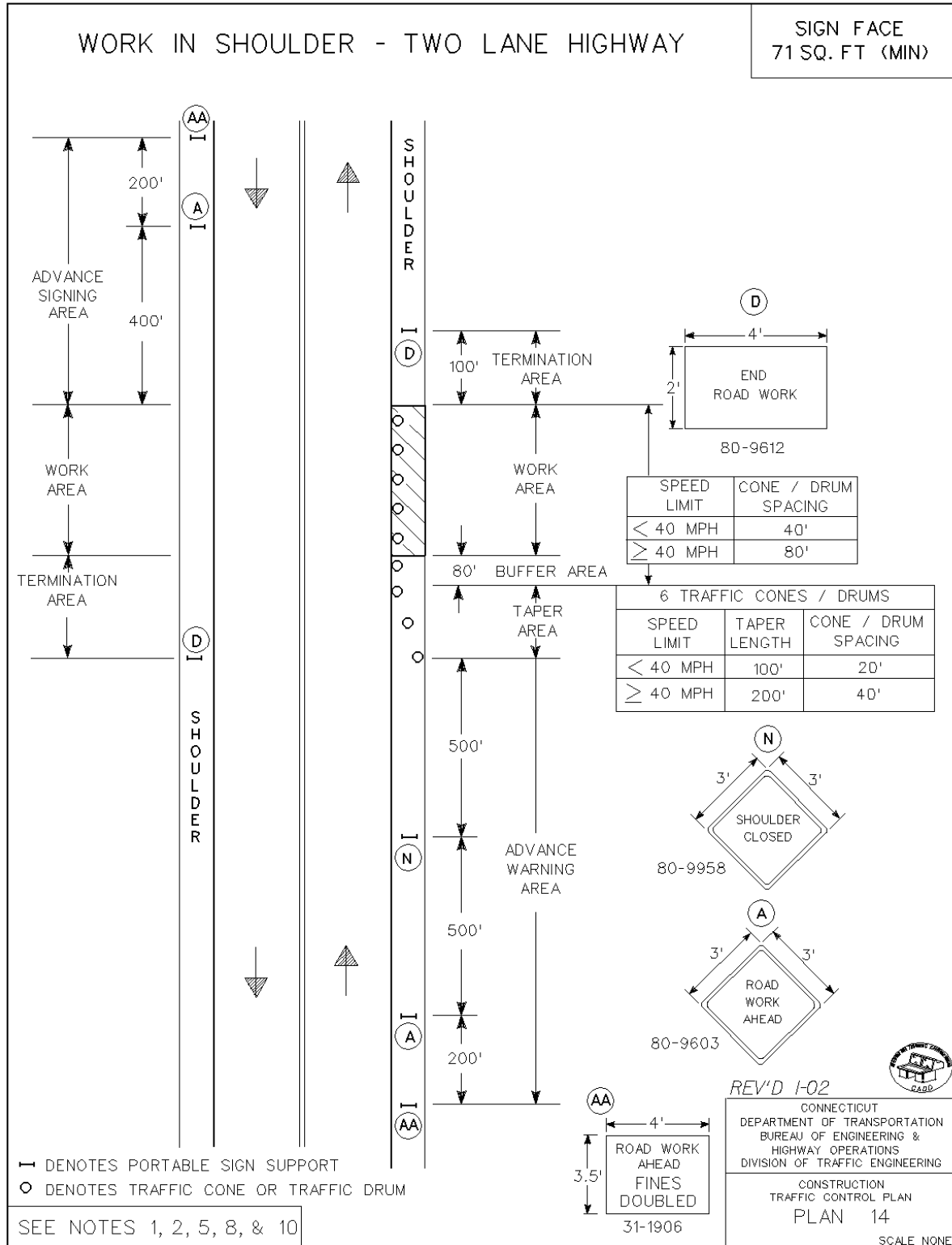
REV'D 1-02



CONNECTICUT
DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING &
HIGHWAY OPERATIONS
DIVISION OF TRAFFIC ENGINEERING

CONSTRUCTION
TRAFFIC CONTROL PLAN
PLAN 13
SHEET 2 OF 2 SCALE NONE

APPROVED J. Carey DATE 1-02
PRINCIPAL ENGINEER



ITEM #50- REMOVAL OF EXISTING MASONRY

Work under this item shall conform to the requirements of Section 9.74 of the State of Connecticut Department of Transportation Standard Specifications for Roads, Bridges and Incidental Construction Form 816 amended as follows:

Description: Delete Section 9.74.01 in its entirety and replace with the following:

This work shall include the removal, stockpiling and satisfactory disposal of any excess removed stone masonry and concrete which is necessary for the final completion of the work. Disposal shall be offsite as approved by the Engineer in accordance with the Contractor's written Excess Material Disposal Plan, approved in accordance with the "Water Pollution Control" technical specification.

Construction Methods: Add the following to Section 9.74.03:

Prior to initiating work, the Contractor shall submit for approval, plans and written documentation describing his methods of removal and for constructing falsework and any shielding as required for the protection of traffic, adjacent property, and other environmentally sensitive areas. Approval of the Contractor's plans shall not be considered as relieving the Contractor of any of his responsibility. Working drawings and design computations showing the Contractor's means for any temporary shielding shall be submitted to the Engineer in accordance with Section 1.05.02(2) of the State of Connecticut Department of Transportation Standard Specifications for Roads, Bridges and Incidental Construction Form 816.

The concrete and the stone masonry shall be removed to the limits shown on the plans or as directed by the Engineer. Pneumatic hammers or any other method approved by the Engineer may be used to remove the concrete or stone masonry. Maximum 30 pound hammers shall be used for general removal, while 15 pound hammers shall be used in areas (as determined by the Engineer) where limiting damage or removal of the existing concrete and masonry is necessary. Loose and small concrete or stone masonry fragments shall be removed and cleaned from the portions of the structure to be left in place.

The Contractor shall take the necessary precautions to prevent any damage to the portions of existing structure and utilities that are to remain undisturbed in place and be incorporated in the finished structure. Any damage caused by the Contractor's operations to any portions of the existing structures and utilities that are to remain undisturbed in place, shall be repaired by the Contractor to the satisfaction of the Engineer at no additional expense to the Owner.

When removing the concrete and stone masonry, the Contractor shall take necessary precautions to prevent debris from dropping into wetland or watercourse areas. Material that is not specified for salvage shall become the property of the Contractor and shall be removed, stored on site in a designated area, and then disposed of by the Contractor per the direction and approval of the Engineer.

The Contractor shall deliver any selected surplus masonry to an offsite location as directed by the DEEP.

Basis of Payment: Delete Section 9.74.05 in its entirety and replace with the following:

The removal and satisfactory disposal of any excess removed stone masonry and concrete will be paid for at the contract unit price per cubic yard for “Removal of Existing Masonry”, which price shall include all equipment, tools and labor incidental thereto.

It shall also include all costs associated with the delivery of select surplus masonry to an offsite location as directed by the DEEP.

ITEM #51- REMOVAL OF EXISTING GATE STRUCTURE

Description: Work under this item shall consist of the removal and satisfactory disposal of the existing gate structure. Those items to be removed and disposed of shall include but not be limited to, the existing gate operator, existing gate and mechanism, trash rack, and wood timbers necessary to complete the work as shown on the plans or as ordered by the Engineer. Sketches from a 5/21/2012 underwater inspection of the low level inlet are included with this specification for the Contractor's reference. However, it is noted that these sketches are only approximate and are based on information provided by a diver under limited visibility conditions.

Materials: Not applicable.

Construction Methods: All work shall proceed as directed by and to the satisfaction of the Engineer and in accordance with the details shown on the plans and the requirements of these specifications, or as approved by the engineer in the field.

The Contractor's attention is drawn to the environmental sensitivity of the lake. The Contractor shall perform all work behind secure cofferdams, or provide turbidity control curtains and full shielding by the use of canvas, netting, falsework or other approved means as required to prevent debris, tools, and/or other materials from entering into or dropping into the lake.

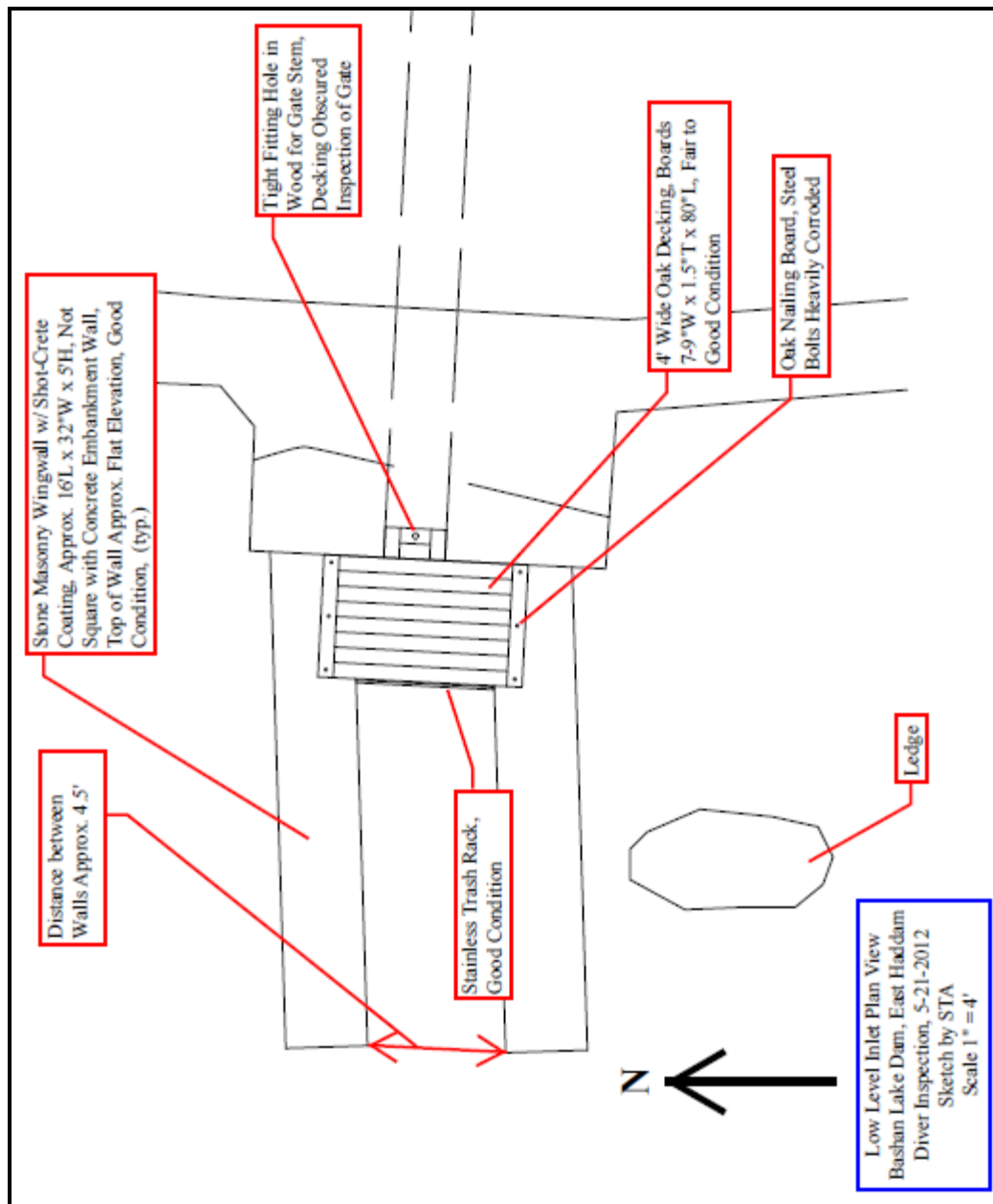
Any material that is not specified for salvage shall become the property of the Contractor and shall be removed, stored on site in a designated area, and then disposed of by the Contractor per the direction and approval of the Engineer.

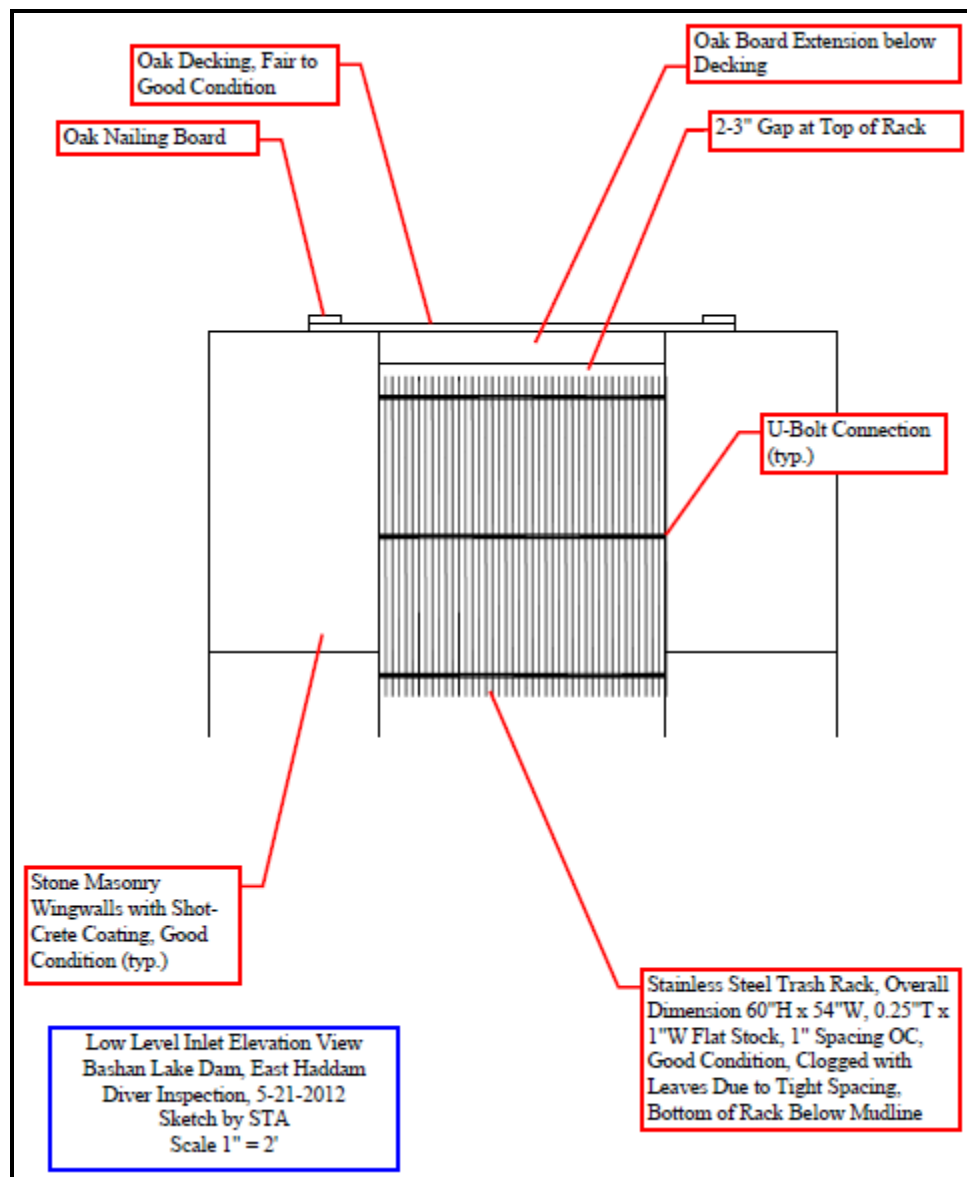
The removal shall not result in damage to any permanent construction (new or existing), utilities or to the adjacent properties or lake area. If damage does occur, it shall be repaired by the Contractor to the satisfaction of the Engineer at no additional expense to the Owner.

Prior to initiating work, the Contractor shall submit for approval, plans and written documentation describing his methods of removal and for falsework and shielding required for the protection of environmentally sensitive areas and adjoining property. Approval of the Contractor's plans shall not be considered as relieving the Contractor of any of his responsibility.

Method of Measurement: Work on this item, being paid for on a lump sum basis, will not be measured for payment.

Basis of Payment: This work shall be paid for at the contract lump sum price for "Removal of Existing Gate Structure", which price shall include all materials, equipment, tools, labor, and all work incidental thereto. Any stone masonry and concrete removed shall be paid for at the contract unit price for "Removal of Existing Masonry".





ITEM #53- CONSTRUCTION BARRICADE TYPE III

Article 9.79.01 – Description: The Contractor shall furnish construction barricades to conform to the requirements of NCHRP Report 350 (TL-3) and to the requirements stated in Article 9.71 “Maintenance and Protection of Traffic,” as shown on the plans and/or as directed by the Engineer.

Article 9.79.02 – Materials: Prior to using the construction barricades, the Contractor shall submit to the Engineer a copy of the Letter of Acceptance issued by the FHWA to the manufacturer documenting that the devices conform to NCHRP Report 350 (TL-3).

Alternate stripes of white and orange Type III or Type VI reflective sheeting shall be applied to the horizontal members as shown on the plans. Application of the reflective sheeting shall conform to the requirements specified by the reflective sheeting manufacturer. Only one type of sheeting shall be used on a barricade and all barricades furnished shall have the same type of reflective sheeting. Reflective sheeting shall conform to the requirements of Article M.18.09.01.

Construction barricades shall be designed and fabricated so as to prevent them from being blown over or displaced by the wind from passing vehicles. Construction barricades shall be approved by the Engineer before they are used.

Article 9.79.03 – Construction Methods: Ineffective barricades, as determined by the Engineer and in accordance with the ATSSA guidelines contained in “Quality Standards for Work Zone Traffic Control Devices”, shall be replaced by the Contractor at no cost to the State.

Barricades that are no longer required shall be removed from the project and shall remain the property of the Contractor.

Article 9.79.04 – Method of Measurement: Construction Barricade Type III will be measured for payment by the number of construction barricades required and used.

Article 9.79.05 – Basis of Payment: “Construction Barricade Type III” required and used will be paid for at the Contract unit price per each. Each barricade will be paid for once, regardless of the number of times it is used.

PAY ITEM	PAY UNIT
Construction Barricade Type III	EA.

ITEM #54- CONSTRUCTION STAKING

Work under this item shall conform to the following specifications, which replaces the requirements as outlined in Section 9.80 of the State of Connecticut Department of Transportation Standard Specifications for Roads, Bridges and Incidental Construction Form 816.

Description: The work under this item shall consist of construction layout and reference staking necessary for the proper control and satisfactory completion of all work on the project, except property lines, highway lines, or non-access lines.

Materials: All stakes used for control staking shall be of the same quality as used by the DEEP for this purpose. For slope limits, pavement edges, gutter lines, etc., where so-called "green" or "working" stakes are commonly used, lesser quality stakes will be acceptable, provided the stakes are suitable for the intended purpose.

Construction Methods: The DEEP will furnish the Contractor such control points, bench marks, and other data as may be necessary for the construction staking and layout by qualified engineering or surveying personnel as noted elsewhere herein.

The Contractor shall be responsible for the placement and preservation of adequate ties to all control points, necessary for the accurate re-establishment of all base lines, center lines, and all critical grades as shown on the plans.

All stakes, references, and batter boards which may be required for construction operations, signing and traffic control shall be furnished, set and properly referenced by the Contractor. The Contractor shall be solely and completely responsible for the accuracy of the line and grade of all features of the work. Any errors or apparent discrepancies found in previous surveys, plans, specifications or special provisions shall be called to the Engineer's attention immediately for correction or interpretation prior to proceeding with the work.

During site work, the Contractor shall provide and maintain for the periods needed, as determined by the Engineer, reference stakes at 100 foot intervals outside the slope limits. Further, the Contractor shall provide and maintain reference stakes at 50 foot intervals immediately prior to and during the formation of subgrade and the construction of all subsequent pavement layers. These stakes shall be properly marked as to station, offset and shall be referenced to the proposed grade, even if laser or GPS machine controls are used.

The Contractor shall provide and maintain reference stakes at drainage structures, including reference stakes for the determination of the structure alignments as may be needed for the proper construction of the drainage structure. The reference stakes shall be placed immediately prior to and maintained during the installation of the drainage structure. These stakes shall be properly marked as to station, offset and shall be referenced to the proposed grade.

The Contractor shall furnish copies of data used in setting and referencing stakes and other layout markings used by the Contractor after completion of each operation.

The Contractor shall provide safe facilities for convenient access by DEEP forces to control points, batter boards, and references.

All staking shall be performed by qualified engineering or surveying personnel who are trained, experienced and skilled in construction layout and staking of the type required under the contract. Prior to start of work, the Contractor shall submit for review and comment the qualifications of personnel responsible for construction staking on the project. On all projects with an original contract value greater than \$25 million and bridge rehabilitation and reconstruction projects greater than \$10 million, surveying shall be performed under the direct supervision of a Professional Surveyor licensed in the State of Connecticut. The submission shall include a description of the experience and training which the proposed staff possesses and a list of state projects the personnel have worked on previously. All field layout and staking required for the project shall be performed under the direct supervision of a person, or persons, of engineering background experienced in the direction of such work and acceptable to the Engineer. If the personnel responsible for construction staking change during the course of the project, then a revised submittal will be required.

The DEEP may check the control of the work, as established by the Contractor, at any time as the work progresses. The Contractor will be informed of the results of these checks, but the DEEP by so doing in no way relieves the Contractor of responsibility for the accuracy of the layout work. The Contractor shall correct or replace, at the Contractor's own expense, any deficient layout and construction work which may be the result of the inaccuracies in the Contractor's staking operations or the failure to report such inaccuracies, or the Contractor's failure to report inaccuracies found in work done by the DEEP or by others. If, as a result of these inaccuracies, the DEEP is required to make further studies, redesign, or both, all expenses incurred by the DEEP due to such inaccuracies will be deducted from any monies due the Contractor.

The Contractor shall furnish all necessary personnel, engineering equipment and supplies, materials, transportation, and work incidental to the accurate and satisfactory completion of this work.

Method of Measurement: Construction staking will be at the Contract lump sum for construction staking.

When no price for "Construction Staking" is asked for on the proposal form, the cost of the work described above shall be included in the general cost of the work and no direct payment for "Construction Staking" will be made.

Basis of Payment: Construction staking will be paid for at the Contract lump sum price for "Construction Staking," which price shall include all materials, tools, equipment, labor and work incidental thereto. A schedule of values for payment shall be submitted to the DEEP for review and comment prior to payment.

ITEM #55- CONSTRUCTION SIGNS- BRIGHT FLUORESCENT SHEETING

Work under this item shall conform to the following specifications, which replaces the requirements as outlined in Section 12.20 of the State of Connecticut Department of Transportation Standard Specifications for Roads, Bridges and Incidental Construction Form 816.

Description: The Contractor shall furnish construction signs with bright fluorescent sheeting and their required portable supports or metal sign posts that conform to the requirements of NCHRP Report 350 (TL-3). The construction signs and their required portable supports or metal sign posts shall conform to the signing requirements stated in Article 9.71 "Maintenance and Protection of Traffic", as shown on the plans and/or as directed by the Engineer.

Materials: Prior to using the construction signs and their portable supports, the Contractor shall submit to the Engineer a copy of the Letter of Acceptance issued by the FHWA to the manufacturer documenting that the devices (both sign and portable support tested together) conform to NCHRP Report 350 (TL-3).

Portable sign supports shall be designed and fabricated so as to prevent signs from being blown over or displaced by the wind from passing vehicles. Portable sign supports shall be approved by the Engineer before they are used. Mounting height of signs on portable sign supports shall be a minimum of 1 foot and a maximum of 2 feet, measured from the pavement to the bottom of the sign.

All sign faces shall be rigid and reflectorized. Sheet aluminum sign blanks shall conform to the requirements of Article M.18.13. Metal sign posts shall conform to the requirements of Article M.18.14. Application of reflective sheeting, legends, symbols, and borders shall conform to the requirements specified by the reflective sheeting manufacturer. Attachments shall be provided so that the signs can be firmly attached to the portable sign supports or metal posts without causing damage to the signs. A Materials Certificate and Certified Test Report conforming to Article 1.06.07 shall be required for the reflective sheeting.

The following types of construction signs shall not be used: mesh, non-rigid, roll-up, corrugated or waffle board types substrates, foam core and composite aluminum sign substrates.

Reflective sheeting shall conform to the following:

The fluorescent orange prismatic retroreflective sheeting shall consist of prismatic lenses formed in a transparent fluorescent orange synthetic resin, sealed, and backed with an aggressive pressure sensitive adhesive protected by a removable liner. The sheeting shall have a smooth surface.

Physical Properties:

A. Photometric - Coefficient of Retroreflection R_A

When the sheeting applied on test panels is measured in accordance with ASTM E 810, it shall have minimum coefficient of retroreflection values as shown in Table I. The rotation angle shall be as designated by the manufacturer for test purposes, the observation angles

shall be 0.2 degrees and 0.5 degrees, the entrance angles (component B₁) shall be -4 degrees and +30 degrees.

TABLE I
Minimum Coefficient of Retroreflection R_A
Candelas per footcandle per square foot

Observation Angle (deg.)	Entrance Angle (deg.)	R _A Orange
0.2	- 4	200
0.2	+ 30	90
0.5	- 4	80
0.5	+ 30	50

The rotation shall be as designated by the manufacturer.

B. Daytime Color

Color shall conform to the requirements of Table II. Daytime color and maximum spectral radiance factor (peak reflectance) of sheeting mounted on test panels shall be determined instrumentally in accordance with ASTM E 991. The values shall be determined on a Hunter Lab Labscan 6000 0/45 Spectrocolorimeter with option CMR 559 (or approved equal 0/45 instrument with circumferential viewing illumination). Computations shall be done in accordance with ASTM E 308 for the 2 degree observer.

TABLE II
Color Specification Limits** (Daytime)

Color	1		2		3		4		Reflectance Limit Y (%)	
	X	Y	X	Y	X	Y	X	Y	MIN	MAX
Orange (new)	.583	.416	.523	.397	.560	.360	.631	.369	28	-
Orange (weathered)	.583	.416	.523	.397	.560	.360	.631	.369	20	45

Maximum Spectral Radiance Factor, new: 110%, min.
weathered: 60%, min.

** The four pairs of chromaticity coordinates determine the acceptable color in terms of the CIE 1931 standard colorimetric system measured with standard illuminant D65.

C. Nighttime Color

Nighttime color of the sheeting applied to test panels shall be determined instrumentally in accordance with ASTM E 811 and calculated in the u', v' coordinate system in accordance with ASTM E 308. Sheeting shall be measured at 0.33 degrees observation and -4 degree entrance at rotation as determined by the manufacturer for test purposes. Color shall conform to the requirements of Table III.

TABLE III
Color Specification Limits ** (Nighttime)

Color	1		2		3		4	
	u'	v'	u'	v'	u'	v'	u'	v'
Orange (new and weathered)	.400	.540	.475	.529	.448	.522	.372	.534

D. Resistance to Accelerated Weathering

The retroreflective surface of the sheeting shall be weather resistant and show no appreciable cracking, blistering, crazing, or dimensional change after one year's unprotected outdoor exposure in south Florida, south-facing and inclined 45 degrees from the vertical, or after 1500 hours exposure in a xenon arc weatherometer in accordance with ASTM G26, Type B, Method A. Following exposure, panels shall be washed in a 5% HCL solution for 45 seconds, rinsed thoroughly with clean water, blotted with a soft clean cloth and brought to equilibrium at standard conditions. After cleaning, the coefficient of retroreflection shall be not less than 100 when measured as in D.2, below, and the color is expected to conform to the requirements of Tables II and III for weathered sheeting. The sample shall:

1. Show no appreciable evidence of cracking, scaling, pitting, blistering, edge lifting or curling or more than 0.031 inch shrinkage or expansion.
2. Be measured only at angles of 0.2 degrees observation, -4 degrees entrance, and rotation as determined by the manufacturer for test purposes. Where more than one panel of color is measured, the coefficient of retroreflection shall be the average of all determinations.

E. Impact Resistance

The retroreflective sheeting applied according to the manufacturer's recommendations to a test panel of alloy 6061-T6, 0.040 inch by 3 inches by 5 inches and conditioned for 24 hours, shall show no cracking outside the impact area when the face of the panel is subjected to an impact of 100 inch-pounds, using a weight with a 0.625 inch diameter rounded tip dropped from a height necessary to generate an impact of 100 inch-pounds, at test temperatures of both 32° F and 72° F.

F. Resistance to Heat

The retroreflective sheeting, applied to a test panel as in E., above, and conditioned for 24 hours, shall be measured in accordance with Paragraph A. at 0.2 degree observation and -4 degree entrance angles at rotation as determined by the manufacturer for test purposes and exposed to 170° ± 5° F for 24 hours in an air circulating oven. After heat exposure the sheeting shall retain a minimum of 70% of the original coefficient of retroreflection.

G. Field Performance:

Retroreflective sheeting processed and applied to sign blank materials in accordance with the sheeting manufacturer's recommendations, shall perform effectively for a minimum of 3 years. The retroreflective sheeting will be considered unsatisfactory if it has deteriorated due to natural causes to the extent that: (1) the sign is ineffective for its intended purpose when viewed from a moving vehicle under normal day and night driving conditions; or (2) the coefficient of retroreflection is less than 100 when measured at 0.2 degrees observation and -4 degree entrance. All measurements shall be made after sign cleaning according to the sheeting manufacturer's recommendations.

Construction Methods: Ineffective signs, as determined by the Engineer and in accordance with the ATSSA guidelines contained in "Quality Standards for Work Zone Traffic Control Devices", shall be replaced by the Contractor at no cost to the State.

Signs and their portable sign supports or metal posts that are no longer required shall be removed from the project and shall remain the property of the Contractor.

Method of Measurement: Construction Signs - Bright Fluorescent Sheeting will be measured for payment by the number of square feet of sign face. Sign supports will not be measured for payment.

Basis of Payment: "Construction Signs - Bright Fluorescent Sheeting" required and used on the project will be paid for at the Contact unit price per square foot. This price shall include the furnishing and maintenance of the signs, portable sign supports, metal sign posts and all hardware. Each sign and support or posts will be paid for once, regardless of the number of times it is used.

ITEM #56- TIMBER WEIR BOARDS

Description: Work under this item shall include furnishing and installing timber weir boards for the proposed low level inlet gate chamber structure as shown on the plans. This item shall not include furnishing and installing timber stop logs within the existing concrete cofferdam used during the previous 1983 dam repairs. The cost of such stop logs shall be included in the contract price for “Handling Water”.

Materials: Prior to fabricating any materials, the Contractor shall provide a submittal letter indicating the type of wood to be used, the source of the wood and dimensional tolerances to which the timber is proposed to be cut.

The timber weir boards shall be heartwood, constructed of Number 1 northern red oak. The boards shall be straight grained with no warps or twists, preferably quartersawn. The number of boards provided shall be sufficient to completely extend to the top of the stainless steel channel board guides.

Construction Methods: The timber weir boards shall be cut to fit the slots within the gate chamber structure as shown on the plans. They shall be notched as shown to ensure a proper seal on each side of the board and shall be cut to such a length as to leave enough space to facilitate removal without difficulty after swelling. The Contractor will be expected to check the fit of the boards within the gate chamber structure and install the boards to the height as directed by the Engineer. Any unused boards shall be delivered by the Contractor to a location as specified by the DEEP.

Method of Measurement: Work on this item, being paid for on a lump sum basis, will not be measured for payment.

Basis of Payment: This work shall be paid for at the contract lump sum price for “Timber Weir Boards”, actually supplied, completed and delivered. The price shall include all materials, equipment, fittings, tools and labor incidental thereto, as well as delivery, unloading and stockpiling of any weir boards at a DEEP designated site.

ITEM #57- VIDEO INSPECTION

Description: Work under this item shall consist of furnishing a video along the full length of the low level outlet conduit, including all necessary materials, labor, tools, and equipment incidental thereto. The intent of the video is to inspect the newly installed sluice gate as well as the low level outlet conduit for any damages which may have occurred as a result of the lake drawdown or other Contractor's work.

Materials: The video shall be in color and be taken with a remote, crawler equipped camera with pan, tilt and zoom capabilities, auxiliary light head and elevator capable of centering in up to a 36" diameter pipe. The equipment shall be capable of measuring the distance traversed along the conduit. All equipment shall be dedicated to raw drinking water supply and potable water use in compliance with AWWA standards for potable water inspection.

Construction Methods: The video shall be taken immediately after the new sluice gate is installed, after lake drawdown operations have ceased but prior to the construction of the downstream concrete buttress.

The Contractor shall provide, within 7 calendar days of the inspection and for the Engineer's approval, two copies of the video inspection on suitable electronic media, compatible with both Microsoft Windows 7 and the current version of Windows Media Player.

Note that a previous video inspection of the conduit was performed 4/24/2012 by Diving Services Incorporated from Foster, RI.

Method of Measurement: Work on this item, being paid for on a lump sum basis, will not be measured for payment.

Basis of Payment: This work shall be paid for at the contract lump sum price for "Video Inspection", as approved by the Engineer. The price shall include all necessary materials, labor, tools, and equipment incidental thereto.

ITEM #58- MATERIAL TESTING

Description: Work under this item consists of the laboratory or field testing of materials installed during the performance of work including, but not limited to, such materials as concrete, gravel fill, pipe bedding, backfill materials, etc.

Materials: Not applicable.

Construction Methods: The Contractor shall arrange for laboratory and field testing of materials to ensure proper placement as may be requested by the DEEP or its representative. All tests must be performed by a certified testing laboratory, which is registered to perform such testing in the State of Connecticut and is approved by the Connecticut DOT and DEEP in advance.

The type, number, location and timing of these tests shall be as requested and/or approved by DEEP or its representative in the field. Copies of all test results and/or reports shall be forwarded to DEEP and its designated representative directly from the laboratory.

Method of Measurement: This item will be measured for payment for each test performed, with no markup.

The sum of money shown on the estimate and in the itemized proposal as "Estimated Cost" for material testing will be considered the price bid even though payment will be made only for actual work performed. The estimated cost figure is not to be altered in any manner by the bidder. Should the bidder alter the amount shown, the altered figures will be disregarded and the original price will be used to determine the total amount bid for the contract.

Basis of Payment: This work will be paid for in accordance with article 1.09.04 as required for the item "Material Testing," which includes the furnishing of all labor, equipment, and performing all the operations in connection with the provision of material testing. The price shall include all associated, equipment, tools and labor incidental thereto.

If testing shows the material or its placement to be unacceptable according to the specifications, no payment will be made for the test. Otherwise, tests will be paid as incurred with no additional mark-up by the Contractor.